The Dissertation Committee for Meng Huo Certifies that this is the approved version of the following Dissertation:

Empathy, Social Ties, and Well-being in Late Life

Committee:

Karen L. Fingerman, Supervisor

Kira Birditt

Lisa Neff

Hannah Williamson

Empathy, Social Ties, and Well-being in Late Life

by

Meng Huo

Dissertation

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Doctor of Philosophy

The University of Texas at Austin

August, 2019

Dedication

This doctoral dissertation is dedicated to my beloved undergraduate professor, Andrew Christensen, who gives me strength in times of frustration and always serves as a tremendous source of encouragement.

Acknowledgements

I would like to begin by thanking my advisor Karen Fingerman. Her mentorship has been an invaluable asset to my graduate study and life. She gives me hands-on training on specific research skills but also teaches me how to think about the bigger picture. When I feel frustrated, she always offers warm encouragement and emphasizes the importance of perseverance. She builds a solid foundation for my development as a young researcher and also leads by example in life to teach me kindness and compassion. I would never have become who I am today without her.

I am also thankful to my committee members Kira Birditt, Lisa Neff, and Hannah Williamson who are all experts in the field of social relationships and well-being. Their thoughtful feedback has greatly improved this dissertation.

I am grateful for my lab members and friends who have made significant contributions to my success. I would like to specifically acknowledge Jamie, Crystal, Yen-Pi, Eden, and Minyu. Each of them has provided me considerable emotional and scientific support throughout my graduate career. I am also happy to say thank you to my boyfriend Boyang, who has been a key source of support and companionship.

Last but definitely not the least, I would like to express my sincere gratitude to my parents for their love all the time. They genuinely care about me and give me space to grow and pursue my dream. Their positive and respectful attitudes towards older adults also motivate me to enter and explore the field of gerontology.

Abstract

Empathy, Social Ties, and Well-being in Late Life

Meng Huo, PhD

The University of Texas at Austin, 2019

Supervisor: Karen L. Fingerman

Older adults who have stronger social ties often lead longer, happier and healthier lives. It is crucial to examine what factors may underlie these stronger ties. Human bonding relies on continuous awareness and response to others' emotions. Thus, individual differences in empathy, the ability to share and understand others' thoughts and feelings, may explain variability in older adults' social lives and well-being. I drew on data from the Daily Experiences and Well-being Study, where adults aged 65+ reported on their empathy and background characteristics and listed their social partners (close family and friends). Older adults participated in intensive daily data collection for 5 to 6 days. They indicated encounters with social partners and mood every 3 hours each day and support exchanges (e.g., emotional, practical, advice) at the end of each day. Study 1 examined older adults' empathy and their overall social networks. Multiple regressions showed that more empathic older adults did not have larger networks but they engaged in support exchanges with a greater number of social partners and reported greater affection than less empathic older adults. Study 2 examined older adults' empathy and daily support exchanges. Multilevel models revealed that more empathic older adults

were more likely to provide each type of support and they found their helping behaviors more rewarding on a daily basis. Study 3 explored whether more empathic older adults were exposed to more social partners' major life problems and suffered from interacting with these social partners throughout the day. Multilevel models found that more empathic older adults reported a greater number of social partners who incurred major life problems. Yet, being more empathic seemed to protect older adults' well-being during encounters with these social partners. These studies identify a promising role that empathy plays in facilitating older adults' social experiences and promoting their resilience in the face of stress. Understanding empathy in late life has the potential to shed light on future interventions targeting older adults who suffer isolation and who are at risk of health concerns.

Table of Contents

List of Tables

List of Figures

GENERAL INTRODUCTION

Individuals who have larger social networks and stronger social ties typically report better emotional, cognitive and physical well-being (Charles & Carstensen, 2010; Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015; Holt-Lunstad, Smith, & Layton, 2010). Thus, it is crucial to understand factors that underlie variation in individuals' social ties. This dissertation seeks to understand how individual differences in empathy (i.e., the ability to share and understand others' emotions) contribute to variability in the social world (Decety & Svetlova, 2012). For example, more empathic individuals may be more attuned to others' emotions and engage in prosocial behaviors, whereas less empathic individuals likely ignore important social cues and have fewer social connections (Batson, 2011; Eisenberg, Eggum, & Giunta, 2010; Hoffman, 2008). Given that individuals place stronger values on close social ties as they age (Charles & Carstensen, 2010), empathy may be a cornerstone of successful aging.

Yet, prior studies have predominantly examined empathy in younger populations (e.g., de Wied, Branje, & Meeus, 2007; Eisenberg, 2000; Hoffman, 2001; Lovett & Sheffield, 2007; van Lissa, Hawk, Branje, Koot, & Meeus, 2016). Only a few laboratory experiments included older adults but they assessed older adults' monetary donation to strangers (Beadle, Sheehan, Dahlben, & Gutchess, 2015; Sze, Gyurak, Goodkind, & Levenson, 2012). Older adults prefer spending time with their close partners (i.e., family, friends; Charles & Carstensen, 2010). Examining everyday experiences with these social partners may reveal a more accurate portrait of the role that empathy plays in late life.

Below I define empathy and introduce theories of empathy. I discuss development of empathy across the lifespan and its importance in late life. I review research on empathy and social experiences. I end this chapter with the three studies conducted as part of this dissertation.

DEFINITION OF EMPATHY

Scholars do not agree on a precise definition of empathy, but there is a consensus that empathy includes both emotional and cognitive components (Cox et al., 2012; Cuff, Brown, Taylor, & Howat, 2016; Decety & Svetlova, 2012; Moore, Dev, Jeste, Dziobek, & Eyler, 2015). Emotional empathy refers to vicariously experiencing emotions mood-congruent to others' emotions (Batson, 2011; Eisenberg, 2000). For example, when witnessing crying babies, individuals with greater emotional empathy often share the babies' sadness and experience negative emotions (e.g., distress, frustration or even anger). Cognitive empathy allows individuals to take others' perspectives and understand others' intentions (Decety & Jackson, 2004; Ickes & Hodge, 2011; Singer, 2006). Using the same example of crying babies, individuals with greater cognitive empathy typically understand the reasons behind the babies' tears more accurately (e.g., they understand that the babies may need attention or feel hungry). Emotional and cognitive empathy are distinct constructs and activate distinct brain regions (Cox et al., 2012; Shamay-Tsoory, Aharon-Peretz, & Perry, 2009; Zaki, Weber, Bolger, & Ochsner, 2009). These two components are both associated with social experiences (Cuff et al., 2016; de Waal, 2008). Scholars often examine overall empathy that combines both components.

Prior research has assessed empathy either as a momentary experience that varies by context (i.e., state empathy; Richter & Kunzmann, 2011; Sze et al., 2012) or as a personality-like trait that varies by individual (i.e., trait empathy; Baron-Cohen & Wheelright, 2004; Beadle et al., 2015). State empathy can be induced by showing emotional pictures or videos of positive or negative experiences. Researchers have examined state empathy by linking it to encounters with strangers or confederates in the laboratory environment (e.g., Beadle et al., 2015; Sze et al., 2012). By contrast, researchers tend to assess trait empathy in surveys or scales (e.g., the Interpersonal Reactivity Index, the Empathy Quotient) and ask whether individual differences in trait empathy account for variability in their social experiences (e.g., Bailey, Henry, & Hippel, 2008; Grühn, Rebucal, Diehl, Lumley, & Labouvie-Vief, 2008; Manczak, DeLongis, & Chen, 2015). Prior research suggests that trait and state empathy interact to influence individuals' emotions and behaviors (Cuff et al., 2016). Indeed, trait empathy may set a range of a person's empathy levels, but how empathic this person feels at the moment may vary by context. A neuroimaging study showed that compared to their counterparts with low trait empathy, individuals with high trait empathy exhibited greater activation in empathy-related brain areas under cognitive load (Rameson, Morelli, & Lieberman, 2012). A recent eye-tracking study also revealed that participants with high trait empathy had fewer attentional blinks when viewing sad faces, suggesting a more effective processing of emotional information (Kang, Ham, & Wallraven, 2017).

It is necessary to distinguish trait empathy from personality traits. Prior research has linked empathy to the big five personality traits (e.g., neuroticism, conscientiousness;

Melchers et al., 2016; Mooradian, Davis, & Matzler, 2011) but empathy is most relevant to agreeableness (i.e., the tendency to be cooperative, considerate, and sympathetic). Both empathy and agreeableness are strongly associated with prosocial behaviors and social ties (e.g., Beadle et al., 2015; Graziano & Tobin, 2013; Haas, Ishak, Denison, Anderson, & Filkowski, 2015; Sze et al., 2012). In fact, empathy may be a critical skillset underlying agreeableness. Graziano and colleagues (2007) conducted experiments with college students, revealing that highly agreeable participants displayed more helping behaviors because they were more empathic with the victim's distress (Graziano, Habashi, Sheese, & Tobin, 2007). Moreover, empathy can be induced or trained. Indeed, Graziano and colleagues (2007) also found that participants scoring low in agreeableness increased their helping behaviors when they were induced to feel empathic. Further, agreeableness may only describe individuals characterized by the positive facets of empathy. As illustrated in the next section, sharing others' emotions, especially when these emotions are negative, can lead to detrimental outcomes such as emotional burnouts (Decety & Lamm, 2009; Klimecki & Singer, 2012).

MODELS OF EMPATHY

Scholars raised several theoretical perspectives to understand the process of empathy, among which the Russian Doll Model (de Waal, 2008) has received the most attention. I present and discuss this model below, while also briefly describing the empathy-altruism hypothesis (Batson, 2011) and the empathic accuracy model in intimate relationships (Ickes & Hodges, 2013).

The Russian Doll Model (de Waal, 2008) views empathy as a multidimensional construct that involves different mechanisms. These mechanisms are structured in layers, ranging from a simple mechanism of automatically sharing others' emotions at the core to a complex mechanism of taking others' perspectives at the outer layer. The layered structure resembles a Russian Doll. The mechanism at the core is called the perception-action mechanism (Preston & de Waal, 2002). This mechanism is mostly examined in the field of motor mimicry and mirror neurons (Cuff et al., 2016; de Waal, 2008; Main, Walle, Kho, & Halpern, 2017). The Russian Doll Model emphasizes attention to the emotional side of this mechanism. While perceiving or attending to others' emotions in social encounters, more empathic individuals may experience matching emotions. That is, when observing crying babies, individuals may feel sad, frustrated or even angry (similar negative emotions that are congruent to the babies' emotions). These emotions then evoke multiple action tendencies (i.e., how individuals should behave in response to the babies' emotions). This process of emotion sharing is a key prerequisite for more complex mechanisms situated at the outer layers, but if under-regulated, it will lead self-centered vicarious arousal (i.e., personal distress).

The outer layers require self-other distinction. Individuals who are better at distinguishing their own emotions from others' emotions experience greater concern for others' suffering (i.e., empathic concern) and perceive others' perspectives more accurately (i.e., perspective taking). Batson's (2011) empathy-altruism hypothesis proposes empathic concern as a key predictor of altruism, defined as action beneficial to others regardless of whether it is at a cost to the actor. Yet, the Russian Doll Model posits

that empathic concern and perspective taking are both crucial for individuals to take the best action in response to others' emotions (de Waal, 2008; Main et al., 2017). Cuff and colleagues (2016) discussed the interaction between empathic concern and perspective taking. Individuals who score high in perspective taking but low in empathic concern may be cold-blooded; an extreme example is individuals who are psychopathic (Blair, 2005). In contrast, individuals who score high in empathic concern but low in perspective taking may engage in intrusive helping behaviors or inappropriate social encounters (e.g., unsolicited advice; Oakley, Knafo, Madhavan, & Wilson, 2011). Research has also shown that individuals with autism may exhibit normal empathic concern despite severe deficits in perspective taking (Baron-Cohen & Wheelwright, 2004).

Although placed at different layers, the multiple mechanisms elaborated above remain connected. Indeed, personal distress may co-occur with empathic concern and they are both part of emotional empathy (Eisenberg, 2000; Eisenberg & Eggum, 2009; Hoffman, 2001, 2008). Personal distress is under-studied and researchers often mean empathic concern when they say emotional empathy. I separate them here to explain their differences but for the rest of this dissertation, I refer to empathic concern as emotional empathy and perspective taking as cognitive empathy to be consistent with the literature.

The Russian Doll Model is missing a discussion of the negative aspect of cognitive empathy. Ickes and Simpson (2013) complete this part with their empathic accuracy model in intimate relationships. Their model suggests that accurate understanding of others' emotions is not always beneficial, especially when the others' emotions are stressful or threatening to relationships. Additionally, Hodges and Biswas-

Diener (2007) posit that unregulated cognitive empathy can lead to loss of self, although this can be rare in populations. This discussion aims to bring attention to the downside of empathy, which is in line with the burgeoning empirical literature on this topic (Decety & Lamm, 2009; Klimecki & Singer, 2012; Oakley et al., 2011).

The Russian Doll Model connects empathy to social experiences but it focuses solely on altruism (which is also true for the commonly-cited empathy-altruism hypothesis, Batson, 2011). While empathy is central to helping behaviors, it has also been argued to be a key factor underlying successful social lives (Decety & Svetlova, 2012). Little research to date has empirically tested links between empathy and other aspects of social experiences, especially in late life. I briefly summarize this literature in a section later called How Empathy Operates in the Social World.

DEVELOPMENT OF EMPATHY ACROSS THE LIFESPAN

Empathy emerges from birth and develops with age. Individuals have emotional empathy very early on. Research dating back to 1970s has shown that babies as young as 2 days old already experience and respond to others' distress (Simner, 1971), and this age was brought to 1 day old in a later study (Sagi & Hoffman, 1976). In their experiment, Sagi and Hoffman exposed babies to (a) recordings of the cry of another baby, (b) a synthetic (nonhuman) sound, and (c) silence. Findings revealed that babies cried significantly more often to another baby's cry than to the synthetic sound or silence. As babies grow older, they begin to offer help in response to the others' distress, at first by attracting their caregivers to help and then by taking action themselves (Zahn-Waxler &

van Hulle, 2012). The literature suggests that emotional empathy continues to develop and increase with age even after individuals enter late life (Bailey et al., 2008; Beadle et al., 2015; Phillips, MacLean, & Allen, 2002; Richter & Kunzmann, 2011; Sze et al., 2012). It is possible that individuals gain increasing life experiences as they age, which helps them feel for others.

The ability to understand why another baby cries (i.e., cognitive empathy), however, requires higher cognitive functioning and exhibits a different age-related trajectory (Preston & de Waal, 2002). Cognitive empathy increases dramatically in adolescence due to the rapid development of cognitive functioning during this period (Allemand, Steiger, & Fend, 2014; van der Graaff et al., 2014). Yet, as individuals age, their cognitive empathy seems to decrease with cognitive declines (Bailey et al., 2008; Beadle et al., 2015; German & Hehman, 2006; Moran, 2013; Grainger, Henry, Phillips, Vanman, & Allen, 2017; Ze, Thoma, & Suchan, 2014). Interestingly, research also reveals exceptions. For example, Richter and Kunzmann (2011) conducted an experiment and showed video clips of different social situations to younger and older participants. Some situations are deemed more relevant to younger adults (e.g., risky life transitions, leaving everything behind to start a new life in a new city) whereas others are more relevant to older adults (e.g., loss of social ties due to death). Findings revealed that older adults' deficits in cognitive empathy only occurred when observing situations less relevant to them. That is, older adults were as accurate as younger adults in terms of understanding the sorrow when someone in the video clip lost a closed other.

Despite differential trajectories of emotional and cognitive empathy, there are also two studies that examine overall empathy (that combines emotional and cognitive empathy) with age. A large cross-sectional study revealed an inverse-U-shaped curve with the level of overall empathy peaking at midlife (O'Brien, Konrath, Grühn, & Hagen, 2013). Longitudinal studies, however, have found little age differences in the level of overall empathy (Grühn et al., 2008; Helson, Jones, & Kwan, 2002).

Empathy underlies successful social lives across the life span, but it may play an especially important role in late life. Socioemotional selectivity theory proposes that reduced time horizons change older adults' motivations such that they place stronger values on close ties with family and friends (Carstensen, 2006). Maintaining these close ties have critical implications for their health and well-being (Charles & Carstensen, 2010; Holt-Lunstad et al., 2015; Holt-Lunstad et al., 2010). Research suggests that empathy promotes prosocial behaviors in close ties than peripheral or distant ties (e.g., acquaintances, strangers; Cikara, Bruneau, & Saxe, 2011; Maner & Gailliot, 2007; Smith, Powell, Combs, & Schurtz, 2009; Stürmer, Snyder, & Omoto, 2005). Thus, examining empathy in late life may have the potential to avert loneliness and isolation, strengthen older adults' social ties, and promote successful aging.

Further, when empathy places a cost, the effect may be more salient in late life. The Strength and Vulnerability Integration model (SAVI; Charles, 2010) suggests that people gain strengths in emotion regulation as they age and these strengths help them cope with conflict or distress more effectively. Yet, when conflict or distress become inevitable, older adults may suffer more than younger adults due to declines in

physiological flexibility in late life. That is, older adults may experience a delayed recovery from distress. Older adults are commonly exposed to their social partners' life problems and they may share these social partners' distress. For example, they are often the primary caregiver for their disabled spouse and they continue to help their midlife children who incur major life problems (e.g., health concerns, emotional problems, financial loss; Huo, Graham, Kim, Birditt, & Fingerman, 2019; Pinquart, & Sörensen, 2003, 2011). More empathic older adults may be especially vulnerable in these situations.

Examining when and in what ways empathy may place a cost on older adults' well-being has practical implications. For instance, interventions may assist more empathic older adults to disentangle the distress they share from their own emotions, which allows them to offer more effective help and benefits their well-being (Batson, 2011; Eisenberg & Eggum, 2009; Paciello, Fida, Cerniglia, Tramontano, & Cole, 2012).

HOW EMPATHY OPERATES IN THE SOCIAL WORLD

Empathy varies among individuals, which may help explain the different ways individuals navigate their social worlds. Below I review this literature, which predominantly examined younger populations. Scholars have argued that empathy is a central feature of successful social lives (Batson, 2011; Decety & Svetlova, 2012). Yet, studies have linked low levels of empathy to social isolation and rejection (Baron-Cohen & Wheelwright, 2004; Decety & Lamm, 2009), with little attention on how being more empathic may facilitate social experiences. This review draws on the well-established convoy model of social networks (Antonucci, 2001; Antonucci, Ajrouch, & Birditt,

2013). The convoy is a social network that includes important people in an individual's life. This model assesses the structure, function and quality of individuals' social networks. The structure refers to the number of people that individuals include in their social networks and how often they have contact with these people. The function corresponds to support exchanges and the quality represents the degree of affection and conflict with people in the networks. In the paragraphs below, I briefly summarize the current literature, which has examined empathy and (a) social activities, (b) prosocial behaviors, and (c) relationship qualities.

Social activities

The literature regarding empathy and social activity engagement is surprisingly scant. Most research on empathy examines aggressive and helping behaviors, finding that more empathic individuals may engage in fewer aggressive and more helping behaviors. Aggressive behaviors are not a focus here so I do not review relevant research. I summarize current findings regarding prosocial behaviors in the next section.

Focusing on social activities, empathy seems to be associated with how often individuals engage in social activities and how individuals perceive their engagement in these activities. For example, one study examined both younger and older adults, finding that regardless of age, empathy was associated with engagement in more social activities (e.g., visiting relatives, eating out with friends; Bailey et al., 2008). Another study did not find a link between empathy and social contact, but more empathic individuals perceived their contact as more positive and meaningful (Grühn et al., 2008). Nevertheless, these studies did not examine social activity engagement in the context of individuals' social

networks, which serve as their primary source of social connections (Antonucci et al., 2013; Charles & Carstensen, 2010).

Prosocial behaviors

A rich literature examines the link between empathy and prosocial behaviors. Research has supported the empathy-altruism hypothesis (Batson, 2011). The earliest experiment in empathy and helping behaviors dates back to the classic study by Batson, Duncan, & Ackerman (1981). In this study, participants induced to feel empathic were more likely to request to receive electric shocks in replacement of a confederate. Subsequently, a host of behavioral experiments have shown that more empathic participants are more likely to engage in a variety of prosocial behaviors (e.g., donating money, cooperating in the prisoner dilemma) in the laboratory environment (Beadle et al., 2015; Sze et al., 2012). Moreover, a neuroimaging study with college students found that participants who exhibited greater activation in the septal area of the limbic system (commonly associated with empathy) conducted more helping behaviors in the following 14 days (Morelli, Rameson, & Lieberman, 2012). It is less clear, however, how individuals with varying levels of empathy may provide everyday support to their close partners (except in the literature of intimate relationships; e.g., Verhofstadt, Buysse, Ickes, Davis, & Devoldre, 2008; Verhofstadt et al., 2016).

Further, the empathy-altruism link may vary depending on the type of support provided. Researchers have examined a variety of types of support, including emotional support, practical support, advice, and financial support (Fingerman et al., 2011; Huo, Kim, Zarit, & Fingerman, 2018; Suitor, Pillemer, & Sechrist, 2006). Emotional support

refers to being there when someone is upset and providing comfort. Practical support indicates helping with some errands or housework and offering a ride. Advice involves giving suggestions regarding decision making. Among all, more empathic individuals may not necessarily give more advice. Indeed, advice can be undesired in close ties, given that it may suggest the giver's belief that the recipient lacks control or competence to resolve their own problems (Feng & Magen, 2016; Rafaeli & Gleason, 2009; Seidman, Shrout, & Bolger, 2006). More empathic individuals may be more sensitive to the other party's reluctance towards receiving advice. When these individuals help, they may not choose to give advice. Moreover, more empathic individuals are often willing to devote time and resources to others; they may offer help in more acceptable ways (such as by offering emotional support).

To the best of my knowledge, no research to date has examined the link between empathy and support receipt. Here, I focus on the support that individuals actually receive from others, which is different from perceived support (defined as the perceived availability of help when individuals need; Gleason & Iida, 2015; Reinhardt, Boerner, & Horowitz, 2006; Uchino, 2009). The reciprocity/equity model proposes that individuals typically attempt to balance the support that they receive and provide (Boerner & Reinhardt, 2003; Gleason & Iida, 2015). Given that more empathic individuals offer more help, their social partners who receive such help may also feel more motivated to return help to these individuals. Moreover, more empathic individuals are often more grateful for others' kindness (Breen, Kashdan, Lenser, & Fincham, 2010), which may also encourage the other party to help them in the future.

Relationship qualities

Empathy may also be associated with the quality of individuals' social relationships. As mentioned above, empathy is associated with a variety of prosocial traits (e.g., forgiveness, gratitude) that have been shown to promote relationship qualities (Algoe, Haidt, & Gable, 2008; Breen et al., 2010; Giammarco & Vernon, 2014). Empirically, a 4-wave longitudinal study with participants aged 10 to 87 in Wave 1 revealed a consistent positive link between empathy and positive relations with others across 12 years (Grühn et al., 2008). Moreover, a plethora of research confirms this link in couple relationships (e.g., Cohen, Schulz, Weiss, & Waldinger, 2012; Paleari, Regalia, & Fincham, 2005). For example, a study conducted in the UK examined empathy in opposite-sex couples aged 16 to 56 and found that empathy was positively associated with relationship satisfaction (Cramer & Jowett, 2010).

It is important to also consider conflict in social ties, which typically has more salient effect on well-being than affection (Rook, 2001, 2015). Some studies in early life have linked empathy to reduced conflicts in adolescents' relationships (de Wied et al., 2007; van Lissa et al., 2016) and young adults' relationships (Cramer & Jowett, 2010). Indeed, more empathic individuals may find it easier to forgive potentially offensive behaviors in interpersonal encounters (Breen et al., 2010; Davis & Gold, 2010; Giammarco & Vernon, 2014). Prior research also finds that more empathic individuals are more likely to use problem solving styles and less likely to use confrontational styles in solving conflicts (Carlo et al., 2012; Rizkalla, Wertheim, & Hodgson, 2008).

Yet, empathy can also lead to conflict under certain circumstances. Ickes and

colleagues (2013) pointed out that perception of social partners' actual but unpleasant feelings could undermine relationship qualities and also violate the social partners' privacy (Ickes & Hodges, 2013). Instead, sometimes inaccurate but more cooperative views of the other party's feelings may help resolve conflicts (Rusbult, Finkel, Kumashiro, 2009). Future research should capture individuals' conflict in real-life settings and explore the link between empathy and conflict. For example, it is possible that more empathic individuals are more alert to distress and potential conflict in relationships but they also resolve conflict more effectively.

THE CURRENT STUDIES

This dissertation aims to add to the literature regarding empathy and refines our understanding of social lives and well-being in late life. This dissertation includes three studies regarding empathy in late life. I first examined how older empathy's empathy was associated with the way they construct and behave in their social worlds. I asked whether more empathic older adults had larger social networks, and whether they were more actively involved in contact and support exchanges with these partners. I also expected empathy to be associated with the qualities of these social ties. Study 2 then examined links between older adults' empathy and daily support exchanges. I expected more empathic older adults provide and receive more support on a daily basis than less empathic older adults. I also examined whether older adults' empathy influenced their mood on days when they engaged in these exchanges. Further, more empathic older adults likely offer support to their social partners because they are aware of these social

partners' problems. Yet, it is unclear whether awareness of these problems may place a cost on older adults' well-being. In study 3, I asked whether more empathic older adults end up being exposed to more social partners suffering problems. I also explored whether being empathic placed a burden on older adults' well-being when they interacted with these social partners throughout the day.

In sum, these studies utilized a multi-method approach to assess older adults' empathy and examined their social experiences and well-being. I compared older adults' social networks by their levels of empathy and also took a closer look at their everyday experiences with members in their social networks. Findings contribute to the scant literature regarding empathy in late life and advance an understanding of variability in socioemotional aging. Understanding individual differences in social experiences and well-being has the potential to offer new insights into interventions that aim to promote successful aging.

STUDY 1: EMPATHY AND CLOSE SOCIAL TIES IN LATE LIFE

Abstract

Older adults with stronger social ties often lead longer, happier and healthier lives, but these ties may differ based on older adults' ability to share and understand others' emotions (i.e., empathy). This study asked how empathy was associated with the way that older adults construct and engage in their social worlds. I drew on the *Daily Experiences and Well-being Study* to examine how older adults' empathy was associated with the structure (e.g., network size, contact), function (e.g., support), and quality (e.g., affection, conflict) of their close social ties. Participants (N = 333) self-rated empathy and listed their social partners using three concentric convoy circles. Empathy was not associated with older adults' social network structure, but more empathic older adults exchanged support with more social partners and reported greater affection for their social partners. I did not observe a significant link between older adults' empathy and conflict with social partners. Examining empathy advances our understanding of individual differences in older adults' close social ties. This study suggests that empathy may play a promising role with regard to promoting older adults' social experiences and strengthening their close ties.

Keywords: empathy, social ties, contact, support, quality

Study 1 Introduction

Older adults with stronger social ties often lead longer, healthier and happier lives (Charles & Carstensen, 2010; Holt-Lunstad et al., 2010). Thus, it is crucial to understand what factors may underlie these strong ties. Human bonding typically relies on individuals' awareness and responses to others in social context. Empathy, the ability to share and understand others' emotions, may be a central feature of older adults' social lives and a cornerstone of successful aging (Decety & Svetlova, 2012). Indeed, individual differences in empathy may explain the different ways that older adults behave in their social worlds. More empathic older adults may be more attuned to others' emotions and sustain better quality ties with more people. Less empathic older adults, on the contrary, may ignore key social cues and incur ostracism (Batson, 2011; Grühn et al., 2008; Kang et al., 2016). To date, however, little research has tested these associations between empathy and older adults' close social ties in real-life settings.

Addressing this research question may advance our understanding of older adults' social lives. Older adults prioritize their close ties with family and friends, which may serve as these older adults' primary source of social connections and support (Charles & Carstensen, 2010). I was interested in whether and in what ways empathy was associated with these important social ties. For example, I asked whether more empathic older adults had a greater number of close social ties and/or were more involved (e.g., contact, support) in these ties than their less empathic counterparts. I also assessed links between older adults' empathy and the qualities of their close ties. Findings offer promising

insights into interventions targeting older adults who lack close social ties or incur isolation.

EMPATHY AND CLOSE SOCIAL TIES IN LATE LIFE

Human beings are innately social and empathy may be a requisite for them to lead a successful social life (Decety & Svetlova, 2012). I was interested in whether individual differences in empathy explained variation in older adults' close social ties. Thus, I measured empathy as a personality-like trait that varies across individuals rather than a performance-based experience that varies momentarily (Beadle et al., 2015; Grühn et al., 2008; Sze et al., 2012). Several theoretical perspectives guided our hypotheses. For example, the Perception-Action Model (PAM; Preston & de Waal, 2002) suggests that more empathic individuals *share* others' emotions more automatically than their less empathic counterparts. While sharing emotions, more empathic individuals may feel greater concern and understand others' perspectives more accurately, which allows them to behave more appropriately in social context (de Waal, 2008; Ickes & Hodges, 2013).

To gain a more complete understanding of empathy and close social ties in late life, I also drew on the well-established convoy model to assess these ties (Antonucci et al., 2013). The convoy is a dynamic social network of close social partners that surrounds the individual. Individuals typically exhibit great variation in the structure (e.g., network size, contact frequency), function (e.g., support exchanges) and quality (e.g., affection and conflict) of their social ties (Antonucci et al., 2013; Fiori et al., 2007). Here, I examined how older adults' empathy was associated with each aspect of social convoys.

Social network structure

I first examined how empathy may shape the structure of older adults' close social ties. Older adults typically show great variation in their network size, with gains and losses of social ties over the life course (Cornwell & Laumann, 2015; Fiori et al., 2007; Rook & Charles, 2017). Individual differences in empathy likely explain such variation. Indeed, empathy is a central ability underlying a variety of prosocial behaviors that facilitate relationship formation and maintenance. For example, more empathic individuals are more likely to show gratitude towards others' kindness and forgive others' inappropriate behaviors (Algoe et al., 2008; Breen et al., 2010; Giammarco & Vernon, 2014). Thus, more empathic older adults may have accumulated a greater number of social ties and also tend to establish new ties if they lose someone close in late life. Here, I expected more empathic older adults to report a greater number of social partners than less empathic older adults.

I also examined variability in the number of social partners in older adults' innermost convoy circle (i.e., the partners that individuals cannot imagine life without; Antonucci et al., 2013). Research has revealed that retaining ties to these social partners is especially critical to older adults' well-being (e.g., these ties may provide a sense of self-worth and serve as the primary source of emotional connections; English & Carstensen, 2014; Fung, Carstensen, & Lang, 2001). Here, I asked whether empathy was associated with the size of this innermost network and considered competing hypotheses. On the one hand, more empathic older adults may have bigger social networks in general, which also include more social partners in the innermost circles. On the other hand, more

empathic older adults may limit their innermost networks. More empathic individuals are often more devoted to their social partners (Batson, 2011). Following resource depletion theory (Davey, Janke, & Savla, 2005; Fingerman et al., 2015), more empathic older adults may focus on fewer social partners to guarantee that they have sufficient time, energy, and resources to devote to these partners.

Further, I asked whether empathy was associated with the frequency of contact with social partners. One study revealed a link between older adults' empathy and more active engagement with social partners (e.g., visiting relatives, eating out; Bailey et al., 2008). Another study found that compared to less empathic participants, more empathic adults (aged 21 to 89) perceived their contact as more pleasant and meaningful throughout the day (Grühn et al., 2008), which may facilitate more future contact. Taken together, it may be that more empathic older adults feel more comfortable interacting with friends and family, or that the way these older adults behave attracts more social partners to initiate contact. I expected more empathic older adults to have more frequent contact with social partners than less empathic older adults.

Relationship functions

Close social ties often function as a primary source of support, thus I asked whether empathy was associated with older adults' support exchanges. In this study, I considered three types of support that are frequently exchanged in close ties: emotional support, practical support, and advice (Huo et al., 2019; Swartz, 2009). Emotional support refers to being available when someone is upset. Practical support refers to

running errands or offering transportation. Advice refers to giving suggestions in the face of problematic situations.

The literature has linked empathy to support provision. The empathy-altruism hypothesis argues that empathy may elicit altruistic behaviors in the hope of improving others' welfare (Batson, 2011). Previous studies have also shown that more empathic older adults offer more frequent financial support to strangers in the laboratory (Beadle, Sheehan, Dahlben, & Gutchess, 2015; Sze et al., 2012). Yet, it remains unclear how empathy facilitates older adults' support provision within their social networks. I assessed each type of support separately and expected more empathic older adults to provide emotional support, practical support, and advice to more social partners than less empathic older adults.

In addition, more empathic older adults may receive support from more social partners. Following equity/reciprocity theory (Gleason & Iida, 2015), these empathic older adults, who typically offer more help than less empathic older adults, may receive more support from their social partners in return. Moreover, more empathic older adults may be more aware of others' helping behaviors, which increases these older adults' gratitude and encourages more helping behaviors from their social partners (Algoe et al., 2008; Breen et al., 2010). Thus, I expected more empathic older adults to receive each type of support from more social partners than less empathic older adults.

Relationship qualities

I then turned to the qualities of older adults' close ties and asked whether empathy

was associated with older adults' affection and conflict with their social partners. More empathic older adults may enjoy better quality social ties. Indeed, a 4-wave longitudinal study included participants aged 10 to 87 in Wave 1 and revealed a consistent link between empathy and more positive relations with others across 12 years (Grühn et al., 2008). This link also holds true in a plethora of research examining romantic couples (e.g., Cohen, Schulz, Weiss, & Waldinger, 2012; Paleari, Regalia, & Fincham, 2005). For example, a study conducted in the UK examined empathy in heterosexual couples aged 16 to 56 and found that empathy was positively associated with relationship satisfaction (Cramer & Jowett, 2010). As such, I expected more empathic older adults to experience greater affection for their social partners than less empathic older adults.

It is unclear, however, whether empathy is associated with less conflict. Some studies have found that empathy reduces conflict in adolescents' and young adults' relationships (Cramer & Jowett, 2010; van Lissa et al., 2016). More empathic individuals may show better conflict resolution strategies, such that they anticipate and avoid conflict before it becomes too severe (Simpson, Ickes, & Oriña, 2001). Also, in the face of tensions, more empathic individuals often focus on solving problems rather than arguing or fighting with the other party (Carlo et al., 2012; Rizkalla et al., 2008).

Yet, empathy can also increase conflict. Indeed, accurately detecting others' thoughts and emotions is not always beneficial, especially when the thoughts or emotions are threatening or harmful for social ties (Ickes & Hodges, 2013). For example, accurate awareness of social partners' unpleasant feelings may undermine relationships (Ickes & Hodges, 2013). Instead, an inaccurate but more cooperative view of the other party's

feelings may help resolve conflicts at times (Rusbult, Finkel, Kumashiro, 2009). Here, I considered these competing hypotheses.

OTHER FACTORS ASSOCIATED WITH EMPATHY AND SOCIAL TIES IN LATE LIFE

The current study also considered other participant characteristics that may be associated with empathy and social ties. I included older adults' age, gender, and self-rated health. Findings on age and empathy are mixed. Cross-sectional studies have found either a decline or an inverse U-shaped curve of empathy with age (Denckla, Fiori, & Vingerhoets, 2014; O'Brien et al., 2013). Yet, longitudinal research has documented no age differences in empathy across the life span (Grühn et al., 2008). In addition, women typically report higher levels of empathy and greater involvement in social ties (O'Brien et al., 2013). Prior work has also established that social ties are associated with better health (Holt-Lunstad et al., 2010).

I also controlled for older adults' education, minority and relationship status. People with higher education attainment tend to show greater empathy (Phillips et al., 2002). Studies have also shown that these upper socioeconomic status adults enjoy more satisfying marriages (Conger, Conger, & Martin, 2010; Fingerman et al., 2015). With regard to minority status, studies suggest that individuals report greater empathy towards ingroup members (e.g., Cikara et al., 2011), but few studies have examined racial differences in empathy. There are racial differences, however, in terms of social networks. Compared to White adults, Black adults typically have smaller social networks that include more family than non-family members (Ajrouch, Antonucci, & Janevic,

2001; Fiori et al., 2017). Relationship status may also influence older adults' social experiences, such that married or cohabiting older adults may provide more support to their adult children whereas widowed older adults require more support (Fingerman et al., 2015; Isherwood, Luszcz, & King, 2016).

Last, I also considered two personality traits that are associated with empathy – agreeableness and neuroticism (Graziano et al., 2007; Haas et al., 2015; Mooradian et al., 2011). Highly agreeable people typically report greater empathy and engage in more cooperative behaviors (Graziano et al., 2007; Haas et al., 2015). Highly neurotic people, by contrast, tend to process emotions in a negative manner and behave aggressively in social situations. Thus, it may be harder for highly neurotic people to sustain social ties (Robinson, Ode, Moeller, & Goetz, 2007).

THE CURRENT STUDY

I tested the following hypotheses:

Ho1: Empathy and social network structure

Ho1a: More empathic older adults may have a greater number of social partners than less empathic older adults.

Ho1b: I considered competing hypotheses and asked whether more empathic older adults have a greater or smaller number of partners in the innermost convoy circle.

Ho1c: More empathic older adults may have more frequent contact with their social partners than less empathic older adults.

Ho2: Empathy and relationship functions

Ho2a: More empathic older adults may provide support to a greater number of their social partners than less empathic older adults.

Ho2b: More empathic older adults may receive support from a greater number of their social partners than less empathic older adults.

Ho3: Empathy and relationship qualities

Ho3a: More empathic older adults may experience greater affection for their social partners than less empathic older adults.

Ho3b. I did not specify a hypothesis regarding conflict with social partners and empathy, but examined this issue.

Study 1 Methods

Sample and Procedures

I used data from the *Daily Experiences and Well-being Study* (DEWS), whose procedures were approved by the University of Texas at Austin Institutional Review Board. Data collection occurred in 2016–2017 and included 333 older adults aged 65 and over (65–92, M_{age} = 74.15). Both a priori and post hoc power analyses assured that a sample of 333 had adequate power (*power* = .88) to test an effect as small as 0.03. Participants resided in the greater metropolitan Austin, Texas area, including urban, suburban and rural areas. Criteria for study inclusion were residing in the community and not being employed full time for pay. We oversampled older adults in areas with high-density minority population, so that 33% of the participants self-identified as ethnic or

racial minorities (e.g., African Americans, Hispanic or Latinos). We also recruited participants with the full range of socioeconomic status; although the sample was slightly better educated than the general older population in the greater Austin area (U.S. Census Bureau, 2017). Table 1 describes background information regarding the sample.

Participants completed a 2-hour face-to-face interview and received $50 in compensation. During this interview, participants provided their background characteristics (e.g., age, gender, education, health), rated their empathy levels and reported on their close social ties. Participants were then invited for a 5- to 6-day intensive data collection, during which they reported their experiences with social partners throughout each day. This study did not include data from the intensive data collection.

Table 1: Descriptive Information of Participants (N = 333)

Characteristics	*M*	*SD*	*Range*
Age	74.15	6.57	65–92
Education[a]	5.88	1.59	1–8
Health[b]	3.54	1.02	1–5
Empathy[c]	3.78	0.66	1–5
Agreeableness[d]	3.45	0.49	1–4
Neuroticism[e]	2.42	0.68	1–5
Social network structure			
Total network size[f]	15.02	6.95	0–30
Inner circle size[g]	4.67	2.97	0–10
Contact frequency[h]	5.08	0.99	1–8
Relationship function			
Provided emotional support[i]	5.40	2.78	0–10
Provided practical support[i]	3.48	2.47	0–10
Provided advice[i]	4.59	2.78	0–10
Received emotional support[i]	4.63	2.86	0–10
Received practical support[i]	3.28	2.42	0–10
Received advice[i]	3.56	2.59	0–10
Relationship quality			
Affection[j]	3.63	0.63	1–5
Conflict[j]	1.68	0.56	1–5
		Proportion	
Females		.55	
Minority[k]		.33	
Relationship status[l]		.59	

[a]On a scale from 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), to 8 (*advanced degree*). [b]On a scale from (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), to 5 (*excellent*). [c]Averaged ratings of five empathy items from 1 (*not at all*) to 5 (*a great deal*). [d]Averaged ratings of five agreeableness items from 1 (*not at all*) to 4 (*a lot*). [e]Averaged ratings of four neuroticism items from 1 (*not at all*) to 5 (*a great deal*). [f]Total number of social partners that participants reported using the three concentric convoy circles. [g]Number of social partners (up to 10 social partners) listed in the inner circle. [h]Frequency of contact that older adults had in person or via telephone with up to 10 social partners, coded from 1(*less than once a year or never*) to 8 (*daily*). [i]Number of social partners (up to 10 social partners) with whom participants provided or received each type of support at least once a month. [j]Averaged ratings of three affection items and two conflict items from 1 (*not at all*) to 5 (*a great deal*). [k]Coded as 1 (a *racial minority*), 0 (*not a minority*). [l]Coded as 1 (*married/remarried/cohabiting*), and 0 (*divorced/widowed/separated/never married*).

MEASURES

Empathy

I measured empathy using a 5-item scale adapted from the widely-used Interpersonal Reactivity Index (IRI, empathic concern and perspective taking subscales; Davis, 1983). Example items were: "I often have tender and concerned feelings for people less fortunate than me" and "Before criticizing somebody, I try to imagine how I would feel if I were in their place." Participants rated the extent to which these five statements described them on a scale from 1 (*not at all*) to 5 (*a great deal*). The scale initially included eight statements but interviewer notes and recordings revealed participants' difficulties in understanding three reverse-scored statements (e.g., "Sometimes I do not feel sorry for other people when they are having problems"). Including these reverse-scored items lowered the scale reliability (to α = .60). Thus, I excluded these reverse-scored items and generated an empathy score for each participant by averaging their ratings across five items (α = .73).

Social Convoy

Participants also indicated their close social ties using three concentric convoy circles (Antonucci, 1986; see Appendix). In each circle, participants offered names of people they: (a) felt so close to that it was hard to imagine life without them, (b) to whom they might not feel quite that close to, but who were still very important to them, or (c) social partners they hadn't already mentioned but who were close enough and important enough in their lives that these social partners should also be included in the diagram. On average, each participant listed 15.02 social partners (*SD* = 6.95, ranged from 0 to 30;

total n = 5,002), a higher number than reported by samples in other studies (e.g., n = 11.30 in Ajrouch, Fuller, Akiyama, & Antonucci, 2018; n = 10.82 in Fiori et al., 2007). To avoid fatigue, participants specified details (e.g., contact, support, relationship qualities) with up to 10 social partners (Fiori et al., 2007). In total, 30% of participants (n = 99) had 10 or fewer social partners. For the other 70% of participants (n = 234) who listed over 10 social partners, they elaborated on the 10 closest partners.

Social network structure

Structural indicators included the total number of social partners that participants listed in the convoy, the number of social partners listed in the inner circle of the convoy, and the average frequency of participants' contact with their social partners. The total number of social partners was the sum of partners that participants listed across all three circles. Participants also reported the frequency of their contact with up to their 10 closest social partners, indicating how often they see or have contact with each social partner via phone or by text from 1 (*less than once a year or never*) to 8 (*daily*). I generated a mean score of contact frequency averaging across up to 10 social partners.

Relationship functions

Functional indicators involved participants' support exchanges with social partners (up to 10 social partners). Participants indicated whether they provided or received (a) emotional support, (b) practical support, and (c) advice with each social partner at least once a month with 1 (*yes*) and 0 (*no*). I calculated the total number of social partners who provided and received each type of support at least once a month. I

examined each type of support in separate analyses. Across different types of support, 2% (n = 6) to 8% of participants (n = 26) reported exchanging support at least once a month with all 10 closest social partners.

Relationship qualities

I measured the quality of participants' social ties via affection and conflicts (up to 10 social partners). Participants indicated affection by rating how much they: (a) can share their very private feelings and concerns with each social partner, (b) can rely on each social partner for help if participants have a serious problem, and (c) feel loved and cared for by each social partner (Fingerman et al., 2011). Participants reported their conflicts by rating (a) how much each social partner is critical of the participant and what the participant does, and (b) how much each social partner gets on the participant's nerves (Birditt, Manalel, Sommers, Luong, & Fingerman, 2018). Responses were coded on a scale from 1 (*not at all*) to 5 (*a great deal*). I averaged participants' ratings of affection and conflicts across social partners ($\alpha_{affection}$ = .76, $\rho_{conflicts}$ = .54). Here I calculated the Spearman-Brown formula, which is a more appropriate reliability indicator for two-item scales (Eisinga, Grotenhuis, & Pelzer, 2013).

Control variables

During the 2-hour interview, participants provided their demographic characteristics. Age was reported in years. Gender was coded as 1 (*male*) and 0 (*female*). Participants indicated their education on a scale of 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*),

6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). Participants self-rated their physical health from 1 (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), and 5 (*excellent*; Idler & Kasl, 1991). Participants also reported whether they were married, remarried, cohabitated, divorced, or single. I recoded relationship status as 1 (*married/remarried/cohabiting*), and 0 (*divorced/widowed/separated/never married*). Participants indicated whether they were Hispanic/Latino and their racial group (e.g., Native American, African American, Asian, White). I generated a variable to measure minority status by assigning a 1 to participants who were Hispanic/Latino or non-White (e.g., Black or Asian) and a 0 to participants who were non-Hispanic Whites.

With regard to personality traits, participants completed measures of personality developed for the full adult age range. Participants rated how well each of the five agreeableness items (e.g., helpful, softhearted, sympathetic; Mroczek & Almeida, 2004) described them from 1 (*not at all*) to 5 (*a great deal*). They also rated four neuroticism items (e.g., moody, nervous; Lachman & Weaver, 1997) on a scale from 1 (*not at all*) to 4 (*a lot*). I calculated the agreeableness score (α = .77) and neuroticism score (α = .70) by averaging the ratings.

ANALYTIC STRATEGY

This study examined how older adults' empathy was associated with the structure, function, and quality of their social ties. I estimated multiple regressions controlling for participant age, gender, education, self-rated health, relationship status, minority, agreeableness, and neuroticism. The predictor was participant empathy. For

older adults' network structure, I included three outcomes in separate models: (a) the total number of social partners, (b) the number of social partners in the innermost convoy circle, and (c) the average frequency of participants' contact with up to 10 closest social partners. For the function of older adults' close ties, I predicted the number of social partners who provided and received emotional support, practical support and advice from participants at least once a month (six outcomes in separate models). For relationship qualities, I treated participants' average affection and conflict across the 10 social partners as two separate outcomes.

Study 1 Results

On average, older adults sustained contact with their social partners a few times per month; approximately a third of social partners were listed in the inner circle of the convoy. Older adults provided and received support from about 4 to 5 social partners. Older adults reported relatively high affection and low conflict with their close social partners. Table 2 presents bivariate correlations of demographic characteristics and relationship indicators.

Social network structure

I tested links between older adults' empathy and social network structure, considering network size and contact frequency. Empathy was not associated with the total network size (B = 0.94, p = .11), the number of social partners in the innermost network (B = 0.14, p = .60), or the average frequency of contact that older adults had with their social partners (B = -0.01, p = .90, see Table 3).

Table 2: Correlations between Measures (Participants $N = 333$)

Characteristics	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age	–									
2. Education[a]	-0.07	–								
3. Health[b]	-0.04	0.30***	–							
4. Empathy[c]	-0.07	0.12*	0.01	–						
5. Agreeableness[d]	-0.03	-0.03	0.01	0.33***	–					
6. Neuroticism[e]	-0.13*	-0.09	-0.25***	-0.05	-0.13*	–				
7. Total network size[f]	-0.18**	0.17**	0.17**	0.18**	0.25***	-0.10	–			
8. Inner circle size[g]	-0.09	-0.03	-0.00	0.11	0.19**	-0.06	0.65***	–		
9. Contact frequency[h]	-0.02	-0.18**	-0.07	0.05	0.17**	0.03	0.03	0.21***	–	
Provided support										
10. Emotional[i]	-0.21***	0.02	0.05	0.21***	0.24***	0.00	0.43***	0.30***	0.38***	–
11. Practical[i]	-0.20***	0.00	0.09	0.11*	0.13*	-0.03	0.23***	0.15**	0.52***	0.59***
12. Advice[i]	-0.18**	-0.02	0.00	0.19**	0.24***	0.03	0.33***	0.23***	0.36***	0.78***
Received support										
13. Emotional[i]	-0.10	0.00	-0.07	0.22***	0.20***	0.03	0.29***	0.25***	0.35***	0.67***
14. Practical[i]	0.04	-0.13*	-0.16**	0.12*	0.11	0.03	0.13*	0.14**	0.42***	0.50***
15. Advice[i]	-0.10	-0.04	-0.12*	0.18**	0.09	0.11*	0.18**	0.14*	0.33***	0.60***
16. Affection[j]	-0.10	0.08	0.12*	0.33***	0.23***	-0.16**	0.15**	0.14**	0.16**	0.22***
17. Conflict[j]	-0.14*	-0.24***	-0.24***	-0.03	-0.07	0.24***	-0.16**	-0.05	0.14*	0.09
18. Females	0.03	0.17**	0.04	-0.13*	-0.26***	0.03	-0.24***	-0.23***	-0.13*	-0.28***
19. Minority[k]	-0.11*	-0.37***	-0.35***	0.01	0.02	0.13*	-0.12*	0.09	0.25***	0.10
20. Relationship status[l]	-0.22***	0.17**	0.05	-0.02	-0.12*	0.14*	0.05	-0.01	0.06	0.06

Table 2 – Continued: Correlations between Measures (Participants N = 333)

Characteristics	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
1. Age										
2. Education[a]										
3. Health[b]										
4. Empathy[c]										
5. Agreeableness[d]										
6. Neuroticism[e]										
7. Total network size[f]										
8. Inner circle size[g]										
9. Contact frequency[h]										
Provided support										
10. Emotional[i]										
11. Practical[i]	–									
12. Advice[i]	0.58***	–								
Received support										
13. Emotional[i]	0.40**	0.59***	–							
14. Practical[i]	0.48***	0.57***	0.59***	–						
15. Advice[i]	0.46***	0.66***	0.73***	0.71***	–					
16. Affection[j]	0.05	0.19**	0.19***	0.15**	0.26***	–				
17. Conflict[j]	0.13*	0.09	0.01	0.11*	0.11	-0.11*	–			
18. Females	-0.06	-0.20***	-0.26***	-0.15**	-0.20***	-0.06	0.11	–		
19. Minority[k]	0.11*	0.14*	0.13*	0.16**	0.11	-0.04	0.33***	0.01	–	
20. Relationship status[l]	0.16**	0.05	-0.05	0.03	-0.00	-0.07	0.13*	0.39***	-0.05	–

[a]On a scale from 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), to 8 (*advanced degree*). [b]On a scale from (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), to 5 (*excellent*). [c]Averaged ratings of five empathy items from 1 (*not at all*) to 5 (*a great deal*). [d]Averaged ratings of five agreeableness items from 1 (*not at all*) to 4 (*a lot*). [e]Averaged ratings of four neuroticism items from 1 (*not at all*) to 5 (*a great deal*). [f]Total number of social partners that participants reported using the three concentric convoy circles. [g]Number of social partners (up to 10 social partners) listed in the inner circle. [h]Frequency of

contact that older adults had in person or via telephone with up to 10 social partners, coded from 1(*less than once a year or never*) to 8 (*daily*). [i]Number of social partners (up to 10 social partners) with whom participants provided or received each type of support at least once a month. [j]Averaged ratings of three affection items and two conflict items from 1 (*not at all*) to 5 (*a great deal*). [k]Coded as 1 (a *racial minority*), 0 (*not a minority*). [l]Coded as 1 (*married/remarried/cohabiting*), and 0 (*not married/remarried/cohabiting*).

Relationship function

I then examined whether older adults' empathy was associated with their support exchanges. As shown in Table 4, more empathic older adults provided emotional support ($B = 0.55$, $p = .02$) and advice ($B = 0.47$, $p = .04$) at least once a month to more social partners than less empathic older adults. Empathy was not associated with providing practical support ($B = 0.23$, $p = .29$; see Table 3). Interestingly, more empathic older adults also received emotional support ($B = 0.71$, $p = .003$), practical support ($B = 0.42$, $p = .04$), and advice ($B = 0.68$, $p = .003$) at least once a month from more social partners. [1]

Relationship quality

I also estimated multiple regressions to examine the qualities of older adults' close social ties. Older adults' empathy was associated with greater affection for their social partners ($B = 0.26$, $p < .001$) but not linked to conflict with social partners ($B = -0.01$, $p = .91$; see Table 3).

[1] The links between empathy and (a) providing advice as well as (b) receiving practical support were no longer significant if the Bonferroni correction was used.

Table 3: Nonsignificant Multiple Regressions Predicting Structure, Function and Quality of Older Adults' Ties by Empathy

	Network size		Inner circle		Contact		Provided practical support		Conflict	
Parameter	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*
Intercept	7.88	6.30	3.59	2.84	3.59***	0.93	2.90	2.33	2.53***	0.51
Participant empathy[a]	0.94	0.58	0.14	0.26	-0.01	0.08	0.23	0.21	-0.01	0.05
Participant covariates										
Age	-0.12*	0.06	-0.03	0.03	0.01	0.01	-0.04*	0.02	-0.01	0.00
Gender[b]	-3.62***	0.81	-1.46***	0.37	-0.30*	0.12	-0.48	0.30	0.11	0.07
Education[c]	0.62*	0.25	0.07	0.12	-0.06	0.04	-0.03	0.09	-0.06**	0.02
Health[d]	0.77	0.39	0.07	0.18	0.03	0.06	0.28	0.14	-0.06	0.03
Relationship status[e]	1.84*	0.82	0.63	0.37	0.34**	0.12	0.99**	0.30	0.10	0.07
Minority status[f]	-0.45	0.86	0.74	0.39	0.50***	0.13	0.87**	0.32	0.28***	0.07
Agreeableness[g]	2.32**	0.80	0.75*	0.36	0.30*	0.12	0.52	0.29	-0.03	0.06
Neuroticism[h]	-0.51	0.55	-0.22	0.25	0.04	0.08	-0.10	0.21	0.11*	0.04
F	8.53***		3.96***		5.23***		4.34***		9.12***	
Adjusted R^2	.17		.08		.11		.09		.19	

Note. Older adults $N = 333$. Outcome variables were (a) participants' total network size, (b) the proportion of social partners listed in the inner circle, (c) frequency of contact that participants had with up to 10 closest social partners, (d) the number of social partners receiving practical support from participants at least once a month, and (e) participants' conflict with up to 10 closest social partners.

[a]Averaged ratings of five empathy items from 1 (*not at all*) to 5 (*a great deal*). [b]Coded as 1 (*male*), 0(*female*). [c]On a scale from 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), to 8 (*advanced degree*). [d]On a scale from (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), to 5 (*excellent*). [e]Coded as 1 (a *racial minority*), 0 (*not a minority*). [f]Coded as 1 (*married/remarried/cohabiting*), and 0 (*not married/remarried/cohabiting*). [g]Averaged ratings of five agreeableness items from 1 (*not at all*) to 4 (*a lot*). [h]Averaged ratings of four neuroticism items from 1 (*not at all*) to 5 (*a great deal*).

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 4: Multiple Regressions Predicting the Function and Quality of Older Adults' Close Social Ties by Empathy

	Provided support				Received support						Affection	
	Emotional		Advice[2]		Emotional		Practical[2]		Advice			
Parameter	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*
Intercept	3.81	2.48	2.00	2.53	1.72	2.63	0.02	2.26	2.85	2.45	3.04***	0.58
Participant empathy[a]	0.55*	0.23	0.47*	0.23	0.71**	0.24	0.42*	0.21	0.68**	0.22	0.26***	0.05
Participant covariates												
Age	-0.06**	0.02	-0.06*	0.02	-0.04	0.02	0.02	0.02	-0.03	0.02	-0.01*	0.01
Gender[b]	-1.73***	0.32	-1.23***	0.33	-1.55***	0.34	-0.85*	0.29	-1.06**	0.32	0.03	0.07
Education[c]	0.09	0.10	0.08	0.10	0.18	0.11	-0.06	0.09	0.03	0.10	0.00	0.02
Health[d]	0.21	0.15	0.19	0.16	-0.09	0.16	-0.23	0.14	-0.19	0.15	0.06	0.04
Relationship status[e]	0.88**	0.32	0.74*	0.33	0.26	0.34	0.77*	0.29	0.32	0.32	-0.12	0.08
Minority status[f]	0.86*	0.34	0.85*	0.34	0.81*	0.36	0.56	0.31	0.44	0.33	-0.01	0.08
Agreeableness[g]	0.77*	0.31	0.95**	0.32	0.53	0.33	0.22	0.29	0.01	0.31	0.16*	0.07
Neuroticism[h]	0.02	0.22	0.21	0.22	0.24	0.23	0.05	0.20	0.36	0.22	-0.09	0.05
F	9.20***		7.00***		6.76***		3.61***		4.31***		6.87***	
Adjusted R^2	.19		.14		.14		.07		.09		.14	

Note. Older adults $N = 333$. Outcome variables were (a) the number of social partners receiving and giving support to participants at least once a month, and (b) participants' affection for up to 10 closest social partners.
[a]Averaged ratings of five empathy items from 1 (*not at all*) to 5 (*a great deal*). [b]Coded as 1 (*male*), 0(*female*). [c]On a scale from 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), to 8 (*advanced degree*). [d]On a scale from (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), to 5 (*excellent*). [e]Coded as 1 (a *racial minority*), 0 (*not a minority*). [f]Coded as 1 (*married/remarried/cohabiting*), and 0 (*divorced/widowed/separated/never married*). [g]Averaged ratings of five agreeableness items from 1 (*not at all*) to 4 (*a lot*). [h]Averaged ratings of four neuroticism items from 1 (*not at all*) to 5 (*a great deal*).
*$p < .05$. **$p < .01$. ***$p < .001$.

[2] Links between empathy and (a) providing advice and (b) receiving practical support were no longer significant if the Bonferroni correction was used.

Post hoc tests

I examined the circumstances under which older adults reciprocated support (i.e., they provided and received support at least once a month from the same social partner). The support that was reciprocated did not have to be of the same type. I counted the number of social partners who reciprocated support with older adults and treated this number as the outcome. A multiple regression model revealed that more empathic older adults reciprocated support with more social partners than less empathic older adults (B = 0.52, p = .02).

I also re-estimated models predicting older adults' affection controlling for conflict with social partners, and vice versa. Findings remained the same, such that empathy was only associated with affection (B = 0.27, p < .001, see Table 5).

Table 5: Multiple Regressions Predicting Affection and Conflict Considering Each Other

	Affection		Conflict	
Parameter	*B*	*SE*	*B*	*SE*
Intercept	3.09***	0.60	2.68***	0.53
Participant empathy[a]	0.27***	0.05	0.01	0.05
Participant covariates				
Age	-0.01*	0.01	-0.01	0.01
Gender[b]	0.03	0.08	0.11	0.07
Education[c]	-0.00	0.02	-0.06	0.02
Health[d]	0.05	0.04	-0.05	0.03
Relationship status[e]	-0.12	0.08	0.09	0.07
Minority status[f]	-0.01*	0.08	0.28	0.07
Agreeableness[g]	0.17	0.07	-0.02	0.07
Neuroticism[h]	-0.07	0.05	0.10	0.05
Affection[i]	–	–	-0.05	0.05
Conflict[i]	-0.07	0.06	–	–
F	6.57***		8.31***	
Adjusted R^2	.15		.19	

Note. Older adults $N = 333$. Outcome variables were participants' affection and conflict with up to 10 closest social partners.

[a]Averaged ratings of five empathy items from 1 (*not at all*) to 5 (*a great deal*). [b]Coded as 1 (*male*), 0(*female*). [c]On a scale from 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), to 8 (*advanced degree*). [d]On a scale from (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), to 5 (*excellent*). [e]Coded as 1 (a *racial minority*), 0 (*not a minority*). [f]Coded as 1 (*married/remarried/cohabiting*), and 0 (*divorced/widowed/separated/never married*). [g]Averaged ratings of five agreeableness items from 1 (*not at all*) to 4 (*a lot*). [h]Averaged ratings of four neuroticism items from 1 (*not at all*) to 5 (*a great deal*). [i]Averaged ratings of three affection items and two conflict items from 1 (*not at all*) to 5 (*a great deal*).

*$p < .05$. **$p < .01$. ***$p < .001$.

Study 1 Discussion

Scholars have long proposed the central role that empathy plays in successful social lives, but links between older adults' empathy and close social ties remain understudied. Some studies examined older adults' empathy and prosocial behaviors in laboratory settings (Beadle et al., 2015; Grühn et al., 2008; Sze et al., 2012). Yet, this study utilized an overarching approach and examined social networks of older adults. I asked whether and how empathy was associated with the structure, function and quality of this network. Findings suggest that being more empathic is not associated with larger social network or more contact. Yet, more empathic older adults appear to be involved in more support exchanges and experience greater affection for their social partners.

Interestingly, empathy was not associated with older adults' network structure. That is, more empathic older adults hold a similar number of social ties (including ties in the innermost networks) and engage in contact as often as less empathic older adults. Resource depletion theory (Davey et al., 2005) may still explain these nonsignificant findings, such that empathy perhaps influences how older adults allocate their resources among different social experiences. More empathic older adults may prefer to retain a manageable size of social ties but stay involved in more of these ties. For example, more empathic older adults may devote more time and energy to their social partners and respond to these partners' needs more readily than less empathic older adults.

Indeed, more empathic older adults may make a better use of their close social ties as a venue of support exchanges. I found that more empathic older adults provided and received support from more social partners than less empathic older adults. Findings

offer additional evidence to the empathy-altruism hypothesis (Batson, 2011), revealing that more empathic older adults offer emotional support and advice to more social partners. I did not observe this link for practical support, which requires physical resources and proximity (Swartz, 2009). That said, being empathic may not necessarily facilitate offering practical help to more social partners.

I also found that more empathic older adults received each type of support from more social partners. As I have discussed earlier, social partners of more empathic older adults often receive plenty of support from these older adults and they may feel obligated to reciprocate such support (Gleason & Iida, 2015). Post hoc tests offer preliminary evidence for this idea in that more empathic older adults reciprocate support with more social partners. Yet, this possibility should be interpreted with caution given that this study only relied on older adults' reports. Future research may consider both parties' perspectives and examine the reasons why social partners of more empathic older adults offer more support to these older adults. Moreover, given the homophily principle (i.e., similar people tend to stay together; McPherson, Smith-Lovin, & Cook, 2001), more empathic older adults may have a greater number of social partners who are also more empathic and more likely to help.

Further, this study extends our understanding of how empathy is associated with the qualities of older adults' social ties. In line with prior research (Grühn et al., 2008), more empathic older adults reported greater affection for their social partners. Findings cannot imply causality due to the cross-sectional nature of data. Being more empathic may improve older adults' relationship quality but there may also be a selection bias that

older adults in closer ties are more empathic. Future research is needed to understand the mechanism underlying this link.

I did not observe a link between empathy and conflict in late life, which was inconsistent with the literature using younger populations (Cramer & Jowett, 2010; van Lissa et al., 2016). Scholars have argued that older adults generally tend to avoid conflicts (Birditt, Nevitt, & Almeida, 2014; Charles & Carstensen, 2010), and this tendency may not vary based on their empathy. It is also possible that empathy exacerbates conflict in certain group of older adults. Charles' strength and vulnerability integration model (SAVI; Charles, 2010) posits that older adults incur greater emotional suffering when conflicts or distress becomes hard to avoid. Thus, the link between empathy and conflict may be more evident and salient among older adults who are exposed to chronic stress.

This study is subject to several limitations. I followed prior research (e.g., Grühn et al., 2008) and examined individual differences in empathy using older adults' self-reports. Yet, I acknowledge that self-reports of empathy may be biased and constrain our hypothesis testing. Due to social desirability, older adults may self-report themselves as more empathic and considerate than they truly are. These older adults may also view themselves as being more helpful and having closer social ties. This tendency to have positive self-views may also account for the reported links in certain participants. In addition, older adults' reports of contact, support exchanges, and relationship qualities were all limited to only up to 10 closest social partners. This has been widely used in prior research regarding social network (Ajrouch et al., 2018; Fiori et al., 2007) but it

may also lead to biased estimates in this study. Further, as mentioned above, this study revealed correlational findings. Longitudinal data that track individuals' empathy and social networks across adulthood or on a daily basis are needed. Such data will reveal a clearer view of the role empathy plays in older adults' social ties, which may facilitate the incorporation of empathy into interventions that benefit older adults' social lives and well-being.

In conclusion, this study innovatively introduces the concept of empathy into the literature regarding older adults' social lives. More empathic older adults may not necessarily have more social ties; yet, they engage in more support exchanges and have more positive feelings about social partners than less empathic older adults. That is, despite the correlational nature of this study, being more empathic may still have the potential to improve the function and quality of older adults' close social ties. Findings may inspire more work on individual differences in socioemotional aging and carry practical implications for relationship therapies in the long run.

STUDY 2: OLDER ADULTS' EMPATHY AND DAILY SUPPORT EXCHANGES

Study 2 Abstract

Older adults' empathy may shape the frequency and types of support that they exchange with their social partners as well as the implications of these exchanges. This study drew on the *Daily Experiences and Well-being Study*, which included adults aged 65 and over and tracked them across 5 to 6 days using mobile phone surveys. Participants (n = 293) rated their empathy and reported their daily support exchanges (e.g., emotional support, instrumental support, advice) as well as mood. Findings showed that more empathic older adults provided each type of support more often. They also received more emotional support than less empathic older adults. Moreover, older adults' empathy moderated the associations between providing support and their daily mood. More empathic older adults maintained their mood regardless of whether they provided support. By contrast, less empathic older adults reported reduced positive mood on days when they provided emotional support and increased positive mood when they provided instrumental support. Greater empathy is associated with more frequent support exchanges; however, more empathic older adults appear immune to such exchanges in terms of their mood. Interestingly, less empathic older adults may find providing emotional support draining but instrumental support rewarding, probably because they are less equipped to cope with others' emotions.

Key words: daily diary, empathy, mood, older adults, support exchange

Study 2 Introduction

Older adults exchange support with family and friends, and these exchanges are central to their own well-being (Fingerman & Birditt, 2010; Huo et al., 2019; Kahana, Bhatta, Lovegreen, Kahana, & Midlarsky, 2013). Yet, some older adults engage in frequent support exchanges, whereas other older adults rarely provide or receive any support (Fiori et al., 2007). I sought to explain these differences by examining empathy, the ability to share and understand others' emotions (Decety & Svetlova, 2012). Prior research has documented the central role of empathy in helping behaviors (Batson, 2011); this ability may shape the frequency and types of support that older adults provide and receive. The literature on empathy, however, has predominantly studied children, adolescents and young adults (Eisenberg, 2000; Eisenberg & Eggum, 2009; Hoffman, 2008). The few laboratory experiments including older adults focused on charitable donation or economic decision making (Bailey et al., 2008; Beadle et al., 2015; Sze et al., 2012). It remains unclear how older adults' empathy may influence the everyday support they exchange with close partners (e.g., family, friends) in real-world settings.

As people age, they tend to have narrower social networks and prefer spending time with close partners rather than with strangers (Charles & Carstensen, 2010). Moreover, older adults may provide and receive emotional support, instrumental support, and advice from their social partners on a daily basis (Fingerman, Kim, Tennant, Birditt, & Zarit, 2016; Huo et al., 2019; Thoits, 2011). Emotional support involves listening to someone's concerns or expressing love and care when they are upset (Burleson, 2003). Instrumental support includes fixing something around the house, running an errand or

providing a ride. Advice refers to helping with a decision or offering suggestions regarding how to cope with a problematic situation (Feng & Feng, 2018). I did not include financial support because it typically occurs infrequently and may not be captured in a daily context (Johnson, 2013; Swartz, 2009).

I also examined whether older adults' empathy influences the implications of their support exchanges. Older adults' support exchanges are reliably associated with their daily mood (Fingerman et al., 2016; Huo et al., 2019). Yet, more empathic older adults may especially enjoy helping others and appreciate receiving support. Alternately, more empathic older adults may suffer more from their partners' distress and experience poorer mood when involved in helping them. I examined these issues. Practically, this study aims to explore a potential role of empathy in developing future interventions that may benefit older adults' support exchanges and well-being.

OLDER ADULTS' EMPATHY AND DAILY SUPPORT EXCHANGES

Empathy varies among individuals, which may be evident in the support that they provide and receive (Batson, 2011; Decety & Svetlova, 2012). Scholars have raised several theoretical perspectives to understand these individual differences. The Perception-Action Model (PAM; Preston & de Waal, 2002) suggests a mechanism whereby more empathic individuals *perceive* others' emotions more readily, experience similar emotions more automatically and feel more motivated to take *action* in response than less empathic individuals. The Russian Doll Model (de Waal, 2008) builds on this perception-action mechanism and proposes this mechanism triggers more complex

emotional and cognitive processes, such as feeling concern for others' misfortunes (i.e., emotional empathy) and taking others' perspectives (i.e., cognitive empathy). Emotional and cognitive empathy have been combined and measured as overall empathy (e.g., Grühn, Rebucal, Diehl, Lumley, & Labouvie-Vief, 2008; Manczak, DeLongis, & Chen, 2016).

Support provision

Empathy may be a central feature of older adults' daily support provision. The empathy-altruism hypothesis suggests that high empathy often leads to altruistic behaviors (Batson, 2011): this empathy-altruism link may apply to emotional and instrumental support. Scholars have argued that empathy is a key requisite for emotional support (Morelli, Lee, Arnn, & Zaki, 2015; Reis, Clark, & Holmes, 2004), such that more empathic children and young adults are more likely to console others in distress than their less empathic counterparts (e.g., Einolf, 2008; Eisenberg, 2000; Stern & Cassidy, 2017). In addition, empathy may facilitate provision of instrumental support. Prior research has linked empathy with offering a ride and helping with chores or other in childhood, adolescence and young adulthood (Eisenberg, 2000; Hoffman, 2008; Morelli et al., 2012; Verhofstadt et al., 2008). These associations may hold true for older adults' support provision to their close partners. I expected more empathic older adults would be more likely to provide emotional and instrumental support than less empathic older adults on a daily basis.

It is unclear, however, whether older adults' empathy is also associated with

advice giving. Although more empathic older adults typically feel more motivated to help their social partners (Batson, 2011), they may not necessarily choose to give advice. Advice can be undesired by the recipients, because it suggests these recipients' lack of control or competence to deal with their own problems (Feng & Magen, 2016; Rafaeli & Gleason, 2009; Seidman et al., 2006). Compared to less empathic older adults, more empathic older adults may be more sensitive to their social partners' reluctance to receiving advice. I explored this issue, but did not specify a hypothesis regarding the advice older adults give to social partners.

Support receipt

Little attention has focused on how older adults' empathy may influence the support that they receive. Equity/reciprocity theory posits that individuals seek to balance the support they receive with the support they provide (Gleason & Iida, 2015; Uehara, 1995). Because more empathic older adults may provide more emotional and instrumental support to their social partners, they may also receive such support more often than their less empathic counterparts. In addition, individuals tend to befriend and interact with similar others (i.e., homophily; McPherson et al., 2001). Thus, compared to less empathic older adults, more empathic older adults may have social partners who are more empathic and who offer emotional and instrumental support more often.

Further, more empathic older adults may detect and report receiving more support regardless of the type of support. Research suggests that more empathic older adults show greater gratitude, possibly due to their stronger sensitivity and recognition of others'

kindness (Breen et al., 2010). Such gratitude from more empathic older adults may also encourage their social partners to help more in general. Here, I expected that more empathic older adults would be more likely to receive emotional, instrumental support and advice than less empathic older adults on a daily basis.

OLDER ADULTS' EMPATHY AND IMPLICATIONS FOR DAILY MOOD

Exchanging support with social partners has implications for older adults' daily mood. Typically, providing support allows older adults to contribute to their social partners' welfare, which may be emotionally rewarding (Gruenewald, Karlamangla, Greendale, Singer, & Seeman, 2007; Huo et al., 2019; Thomas, 2010). Receiving support, by contrast, harms older adults' well-being given that it may violate their feelings of autonomy (Djundeva, Mills, Wittek, & Steverink, 2015; Thomas, 2010). Yet, these associations may vary by how older adults perceive and understand their social partners' emotions during support exchanges (i.e., empathy).

Support provision

Older adults' empathy may be associated with their mood on days when they provide support to social partners; moreover, this association may differ by the type of support they provide (e.g., emotional, instrumental, advice). Providing emotional support may especially require sharing the other party's distress, which can be more intense among older adults scoring higher in empathy (Hodges & Biswas-Diener, 2007; Hoffman, 2008). Prior research has found that providing support is associated with more depressive symptoms in late life when older adults offer emotional support and view such

helping behaviors as stressful (Bangerter, Kim, Birditt, Fingerman, & Zarit, 2015). As such, I expected providing emotional support to be associated with worse mood on a daily basis, yet this link might be stronger among more empathic older adults than less empathic older adults.

When providing instrumental support and advice, however, more empathic older adults may benefit more than less empathic older adults. Research suggests that in close relationships, more empathic individuals are more likely to detect their partners' needs and provide better quality instrumental support and advice (Ickes & Hodges, 2013; Verhofstadt et al., 2008, 2016). It is possible that more empathic older adults are better able to improve their social partners' situations, which may boost these older adults' feelings of usefulness and render these helping behaviors more rewarding (Gruenewald et al., 2007; Thomas, 2010). A recent review suggests that individuals find helping behaviors more beneficial when they believe these behaviors are effective (Inagaki & Orehek, 2017). Thus, I expected that compared to less empathic older adults, more empathic older adults would manifest greater improvements in their mood when providing instrumental support or advice to their social partners.

Support receipt

Older adults' empathy may also influence the associations between receiving support and their own daily mood, regardless of the type of support. The literature has commonly suggested that older adults report worse daily mood when receiving support (Gleason, Iida, Shrout, & Bolger, 2008; Thomas, 2010), yet several exceptions exist. The

negative consequences of receiving support are dampened when the support that older adults receive can be understood. For example, older adults' disabilities may increase their acceptance of receiving support, such that disabled older adults report fewer depressive symptoms and less negative mood than non-disabled older adults when receiving support (Djundeva et al., 2015; Huo et al., 2018). Likewise, compared to less empathic older adults, more empathic older adults may detect their social partners' altruistic intentions more accurately and more easily accept the support they receive from these partners (Breen et al., 2010; Ickes & Hodges, 2013). In addition, scholars have used lack of reciprocity to explain the negative consequences of receiving support (Gleason, Iida, Bolger, & Shrout, 2003; Gleason et al., 2008). More empathic older adults often provide more support to their social partners; thus they may view their support exchanges as more balanced. I asked whether more empathic older adults regulated their mood better when they received support than less empathic older adults. For example, less empathic older adults may experience significantly worse mood on days when receiving support compared to days when they do not. By contrast, more empathic older adults may be able to maintain their mood or even experience better mood when receiving support.

OTHER FACTORS ASSOCIATED WITH OLDER ADULTS' SUPPORT EXCHANGES AND MOOD

This study controlled for other factors that are associated with older adults' empathy, support exchanges, and mood to avoid spurious associations. I considered older adults' age, health, gender, education, minority, relationship status, agreeableness, neuroticism, and number of social partners with problems. As people age, they may incur

more health problems (Chatterji, Byles, Cutler, Seeman, & Verdes, 2015). Women are more empathic and more involved in social ties (Bloise & Johnson, 2007; O'Brien et al., 2013). Better educated people are often more empathic and provide more support to others (Conger et al., 2010; Fingerman et al., 2015; Grühn et al., 2008). African Americans may engage in more contact with social partners and show greater reactivity towards daily events than European Americans (Ajrouch et al., 2001; Cichy, Stawski, & Almeida, 2012). Married or cohabiting older adults provide more support to their adult children whereas unmarried or divorced older adults require more support (Isherwood et al., 2016). Highly agreeable individuals are more skilled at empathizing with others' emotions and typically exhibit more prosocial behaviors (Graziano et al., 2007; Haas et al., 2015). Research has negatively linked neuroticism to empathy (Mooradian et al., 2011). Highly neurotic people tend to experience more depressive symptoms and report worse mood (Robinson et al., 2007; Roelofs et al., 2008). Last, I controlled for the number of social partners with problems. It is established that older adults offer more help to their partners suffering problems (Gilligan, Suitor, Rurka, Con, & Pillemer, 2017; Huo et al., 2019).

Study 2 Methods

Sample and Procedures

I drew on the *Daily Experiences and Well-being Study* (DEWS) conducted in 2016–2017. The DEWS included 333 older adults who resided in the greater Austin, Texas, including urban, suburban and rural areas. Study criteria limited the sample to adults aged 65 and older (65–92, M_{age} = 74.15, SD = 6.57), who resided in the

community and were not employed full time. We used a stratified sampling procedure to obtain a diverse sample, where 45% of the participants were males and 33% were ethnic or racial minorities (e.g., African Americans, Hispanic/Latino). Although this sample was better educated than the general older population in Austin (U.S. Census Bureau, 2017), we included a full spectrum of socioeconomic backgrounds.

Participants completed a 2-hour in person interview to rate their own characteristics such as age, gender, education, health, empathy and personality. This interview also included the convoy assessment of social networks for participants to list their close partners in three concentric circles (Antonucci, 1986; see Appendix). Participants were then invited to complete a 5- to 6-day intensive data collection, where they completed tasks on a handheld Android device throughout the day, including reporting their support exchanges with social partners at the end of each day.

Among the 333 participants who completed the global interviews, 88% (n = 293) finished the end of day survey on at least one day (M_{day} = 4.07, SD = 1.22; total n = 1,151). Statistical analyses revealed that these 293 participants were younger (t = 2.68, p = .01) and less likely to identify as an ethnic or racial minority (χ^2 = 4.50, p = .03) than the other 40 participants who were not part of the daily study. Participants received U.S. $50 for completing the global interview and another U.S. $100 for the daily surveys. Table 6 presents sample description.

Table 6: Descriptive Information of Participant (n = 293) and Correlations between Measures

	M	*SD*	1	2	3	4	5	6	7
1. Age	73.73	6.28	–						
2. Health[a]	3.57	1.03	-0.04	–					
3. Empathy[b]	3.77	0.66	-0.04	-0.01	–				
4. Agreeableness[c]	3.46	0.49	-0.04	0.00	0.34***	–			
5. Neuroticism[d]	2.43	0.69	-0.12*	-0.24***	-0.06	-0.12*	–		
6. # of social partners with problems[e]	2.28	2.09	-0.01	-0.11	-0.20***	0.18**	0.06	–	
7. Days answering surveys[f]	4.07	1.22	-0.05	0.11	0.15**	0.10	-0.04	0.01	–
8. Daily negative mood[g]	1.41	0.43	0.01	-0.26***	0.01	-0.03	0.37***	0.16**	-0.05
9. Daily positive mood[g]	3.75	0.70	-0.12*	0.12*	0.12*	0.25***	-0.12*	0.02	0.04
10. # of social partners in exchanges[h]	2.82	2.11	-0.12*	0.04	0.18**	0.18**	0.08	0.14*	0.27***
	Proportions								
11. Male	.45		0.04	0.05	-0.15*	-0.26***	0.00	-0.21***	-0.02
12. College degree	.57		-0.01	0.31***	0.02	-0.13*	-0.06	0.04	0.05
13. Relationship status[i]	.60		-0.20**	0.04	-0.05	-0.11	0.11	-0.13*	-0.04
14. Minority[j]	.31		-0.15**	-0.34***	0.02	0.05	0.13*	-0.02	-0.16**

Table 6 Continued: Descriptive Information of Participant (n = 293) and Correlations between Measures

	8	9	10	11	12	13	14
1. Age							
2. Health[a]							
3. Empathy[b]							
4. Agreeableness[c]							
5. Neuroticism[d]							
6. # of social partners with problems[e]							
7. Days answering surveys[f]							
8. Daily negative mood[g]	–						
9. Daily positive mood[g]	-0.27***	–					
10. # of social partners in exchanges[h]	0.07	0.08	–				
11. Male	-0.03	-0.06	-0.25***	–			
12. College degree	-0.06	-0.10	0.04	0.19**	–		
13. Relationship status[i]	-0.06	0.10	-0.01	0.39***	0.14*	–	
14. Minority[j]	0.02	0.08	0.00	0.02	-0.30***	-0.02	–

[a]Rated from 1 (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [b]Averaged ratings of five items from 1 (*not at all*) to 5 (*a great deal*). [c]Averaged ratings of five agreeableness items (e.g., considerate) from 1 (*not at all*) to 5 (*a great deal*). [d]Averaged ratings of four neuroticism items (e.g., nervous) from 1 (*not at all*) to 5 (*a great deal*). [e]Number of social partners who had any life problem (e.g., health concerns, emotional problems, housing issues, financial problems, etc.). [f]Number of days participants had end of day surveys. [g]Averaged ratings of three positive items (e.g., calm, content) and five negative items (e.g., nervous, irritated) from 1 (*not at all*) to 5 (*a great deal*). [h]Number of social partners participants reported to have support exchanges with. [i]Recoded as 1 (*married/remarried/cohabiting*), and 0 (*divorced/widowed/separated/never married*). [j]Recoded as 1(a racial or ethnic *minority*) and 0 (*not a minority*).

GLOBAL INTERVIEW MEASURES

Empathy

I measured participants' empathy using a scale modified from the Interpersonal Reactivity Index (IRI, empathic concern and perspective taking subscales; Davis, 1983). The modified scale captured both emotional and cognitive components of empathy. Participants rated how well eight statements described them from 1 (*not at all*) to 5 (*a great deal*). An example emotional empathy item included "I often have tender, concerned feelings for people less fortunate than me". An example cognitive empathy item was "I sometimes try to understand other people better by imagining how things look from their perspective". Many participants reported difficulties understanding the reverse-scored items and were not able to rate the items. Thus, I excluded three reverse-scored items from the original scale and generated a 5-item scale. An example reverse-scored item was "Sometimes I do not feel sorry for other people when they are having problems". I averaged ratings across the five items to assess empathy (α = .73).

Covariates

Participants reported their age, gender rated as 1 (*male*) and 0 (*female)*, physical health rated from 1 (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*; Idler & Kasl, 1995), and relationship status recoded as 1 (*married/remarried/cohabiting*), and 0 (*divorced/widowed/separated/never married*). Participants indicated education from 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional*

degree) to 8 (*advanced degree*). I dichotomized education to 1 (*college degree and above)* and 0 (*below college degree*; Montez, Hummer, & Hayward, 2012). Participants indicated their ethnic and racial identities, from which I generated a variable coded as minority status 1 (*ethnic or racial minority*) and 0 (*non-Hispanic White*). Participants rated how well five agreeableness items (e.g., helpful, softhearted, sympathetic; Mroczek & Almeida, 2004) and four neuroticism items (e.g., moody, nervous; Lachman & Weaver, 1997) described them on a scale from 1 (*not at all*) to 5 (*a great deal*). I averaged the ratings to measure agreeableness (α = .77) and neuroticism (α = .70). Participants also indicated whether each social partner had seven life problems (e.g., health concerns, emotional problems, financial issues; Huo et al., 2019) in the past year. I calculated the number of social partners who had any problem. Table 6 presents bivariate correlations among these demographic variables.

DAILY SURVEYS MEASURES

Support exchanges

At the end of each day, participants indicated whether they provided and received emotional support, instrumental support and advice from any social partner on 1 (*yes*) and 0 (*no*; Fingerman et al., 2016; Huo et al., 2019).

Mood

As part of an ecological momentary assessment protocol, participants rated their positive and negative mood every 3 hours throughout each day. Participants indicated the extent to which they experienced three positive emotions (i.e., calm, loved,

content) and five negative emotions (i.e., nervous, irritated, bored, lonely, sad; Huo et al., 2019, 2018; Piazza, Charles, Stawski, & Almeida, 2013) from 1 (*not at all*) to 5 (*a great deal*). I averaged participants' ratings to measure their positive mood (α = .72) and negative mood (α = .75) every 3 hours. I calculated each participant's maximum mood across 3-hour reports within each day to assess peak daily positive and negative mood.

Analytic Strategy

I first examined the associations between participants' empathy and their daily support exchanges with social partners. Because each participant reported each day on their support provision and receipt from any social partner, I initially estimated two-level models to incorporate the day level (*level 1*) and the participant level (*level 2*). The predictor was participants' empathy. The outcomes included whether participants provided and received (a) emotional support, (b) instrumental support, and (c) advice each day on 1 (*yes*) and 0 (*no*). Each type of support provision and receipt was analyzed in separate models; there were 2 (provide, receive) × 3 (emotional, instrumental, advice) = 6 models. Because the outcomes were binary variables, I estimated logistic regression models with SAS PROC GLIMMIX (Guo & Zhao, 2000). Yet, because the independent variable (i.e., empathy score) was at the participant level, I also estimated ordinary least squares (OLS) regressions predicting the percentages of days when participants provided and received each type of support during the study week (there were also six models). Given that the two-level logistic regressions and OLS regressions revealed the same pattern of findings, I present OLS regression findings for parsimony.

I then tested whether and in what ways participants' empathy moderated the links between their daily support exchanges and daily mood. In this set of hypotheses, I explored how empathy influenced within-participant associations between support exchanges and mood. I estimated two-level models to consider the participant level (*level 2*) and the day level (*level 1*). Predictors were whether participants provided or received each type of support from any social partner each day on 1 (*yes*) and 0 (*no*). The key predictor was the interaction term for participant empathy × provision/receipt of each type of support. I centered each participant's empathy score on the sample mean before assessing the interactions. Given that participants may provide or receive multiple types of support each day, I entered (a) providing emotional support, (b) providing instrumental support, (c) providing advice, and their corresponding interaction terms in one model. Likewise, I included variables regarding receiving three types of support in another model. The outcome variables were participants' positive and negative mood each day. Because the outcomes were continuous, I estimated two-level linear models with PROC MIXED: 2 (provide, receive) × 2 (positive mood, negative mood; outcomes in separate models) = 4 models. I explored significant interactions using simple slope analyses – I tested and plotted links between support exchanges and mood at different levels of empathy (i.e., 1 SD above and below the mean empathy score). Models controlled for participant age, gender, education, health, relationship status, minority, agreeableness, neuroticism, and number of social partners with problems.

Study 2 Results

I present the percentages of days when participants provided and received emotional support, instrumental support and advice from any social partner in Table 7. Overall, participants exchanged each type of support about a third to half of the days during the study week (i.e., 2 days out of 4 days), with emotional support exchanged most often.

Older Adults' Empathy and Daily Support Exchanges

I expected more empathic older adults would provide emotional and instrumental support more often but would not differ in advice giving compared to less empathic older adults. Multiple regressions revealed that more empathic older adults provided emotional support (B = 0.09, p = .005), instrumental support (B = 0.08, p = .02), and advice (B = 0.10, p = .004) on more days (Table 8).

I also expected more empathic older adults to receive each type of support more often. Empathy was only associated with receiving emotional support more often (B = 0.08, p = .01). There were no significant associations between empathy and receiving instrumental support (B = 0.05, p = .10) or advice (B = 0.04, p = .15; Table 8).

Table 7: Percentage of Days on Which Older Adults Provided and Received Support

Variables	Percentage of days
Providing support[a]	
Emotional support	.47
Practical support	.38
Advice	.43
Receiving support[a]	
Emotional support	.33
Practical support	.31
Advice	.28

Note. Older adults n = 293, Days n = 1,151.
[a]Participants indicated whether they provided or received each type of support from any social partners on each day, 1 (*yes*) and 0 (*no*).

Table 8: Multiple Regression Models Predicting Percentages of Days Exchanging Support from Older Adults' Empathy

	Providing						**Receiving**					
	Emotional support		Instrumental support		Advice		Emotional support		Instrumental support		Advice	
Variable	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*
Intercept	0.75*	0.36	0.28	0.35	0.20	0.36	0.71*	0.35	0.55	0.34	0.03	0.32
Participant empathy[a]	0.09**	0.03	0.08*	0.03	0.10**	0.03	0.08*	0.03	0.05	0.03	0.04	0.03
Covariates												
Age	-0.01**	0.00	-0.01	0.00	-0.00	0.00	-0.01**	0.00	-0.00	0.00	-0.00	0.00
Gender[b]	-0.12*	0.05	-0.01	0.05	-0.07	0.05	-0.15***	0.05	-0.17***	0.04	-0.05	0.04
Education[c]	0.09*	0.05	-0.03	0.04	0.02	0.05	0.08	0.04	0.09 *	0.04	-0.01	0.04
Health[d]	0.02	0.02	0.06*	0.02	0.00	0.02	-0.03	0.02	-0.02	0.02	0.00	0.02
Relationship status[e]	0.07	0.05	0.22***	0.05	0.08	0.05	0.05	0.05	0.16***	0.04	0.07	0.04
Minority status[f]	0.03	0.05	-0.01	0.05	0.07	0.05	-0.07	0.05	-0.01	0.05	0.02	0.04
Agreeableness[g]	-0.01	0.05	-0.08	0.05	0.04	0.05	0.01	0.05	-0.07	0.04	-0.01	0.04
Neuroticism[h]	0.00	0.03	0.04	0.03	-0.03	0.03	0.04	0.03	0.02	0.03	0.02	0.03
# of partners with problems[i]	0.02*	0.01	0.02	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.03**	0.01
F	4.61***		5.46***		3.24***		4.94***		3.69***		2.03*	
Adjusted R^2	.11		.14		.07		.12		.09		.04	

Note. Older adults *n* = 293, Days *n* = 1,151. Outcome variables were the percentages of days during the study week when participants provided and received each type of support with any social partners.
[a]Averaged ratings of five empathy items on 1 (*not at all*), 2 (*a little bit*), 3 (*somewhat*), 4 (*quite a bit*), and 5 (*a great deal*). [b]Rated as 1 (*male*) and 0 (*female*). [c]Recoded as 1 (*college degree or above*) and 0 (*below college degree*). [d]Rated from 1 (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [e]Recoded as 1 (*married/remarried/cohabiting*), and 0 (*divorced/widowed/separated/never married*). [f]Recoded as 1 (*a racial or ethnic minority*) and 0 (*not a minority*). [g]Averaged ratings of five agreeableness items (e.g., considerate) on 1 (*not at all*), 2 (*a little bit*), 3 (*somewhat*), 4 (*quite a bit*), and 5 (*a great deal*). [h]Averaged ratings of four neuroticism items (e.g., nervous) on 1 (*not at all*), 2 (*a little bit*), 3 (*somewhat*), 4 (*quite a bit*), and 5 (*a great deal*). [i]Number of social partners who had at least one life problem (e.g., health concerns, emotional

problems, financial problems, etc.). *$p < .05$. **$p < .01$. ***$p < .001$.

OLDER ADULTS' EMPATHY AND IMPLICATIONS FOR DAILY MOOD

Regarding daily mood, I expected that participants' empathy would moderate the links between their daily support exchanges and mood. Two-level moderation models revealed two significant interaction effects: empathy × providing emotional support (B = 0.14, p = .002) as well as empathy × providing instrumental support (B = -0.12, p = .007) on daily positive mood. I did not observe significant moderations with respect to providing advice, receiving any type of support or when predicting daily negative mood (Table 9).

Simple slope analyses showed that more empathic older adults did not differ in positive mood on days when they provided emotional support compared to when they did not provide such support (B = 0.04, p = .26). Less empathic older adults, however, reported reduced positive mood on days when they provided emotional support (B = -0.14, p < .001; Figure 1a).

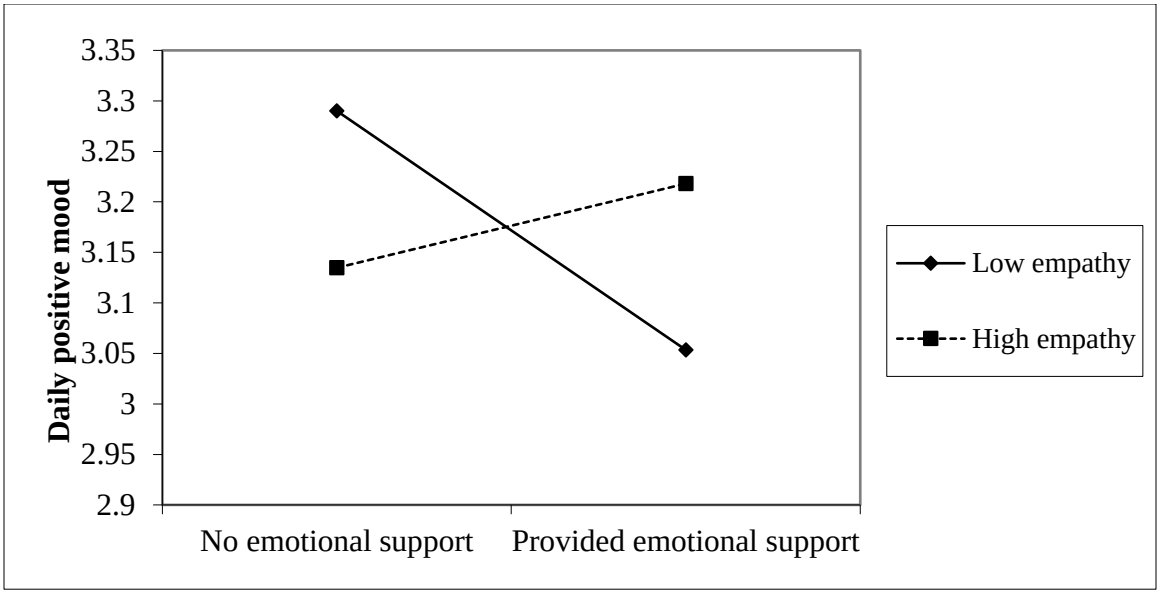
As for providing instrumental support, Figure 1b shows that more empathic older adults maintained their daily positive mood, regardless of whether they provided instrumental support (B = -0.06, p = .09). Yet, less empathic older adults reported greater positive mood on days when they provided instrumental support compared to when they did not (B = 0.09, p = .02).

Table 9: Multilevel Models Predicting Older Adults' Daily Positive Mood from Support Exchanges: Empathy as a Moderator

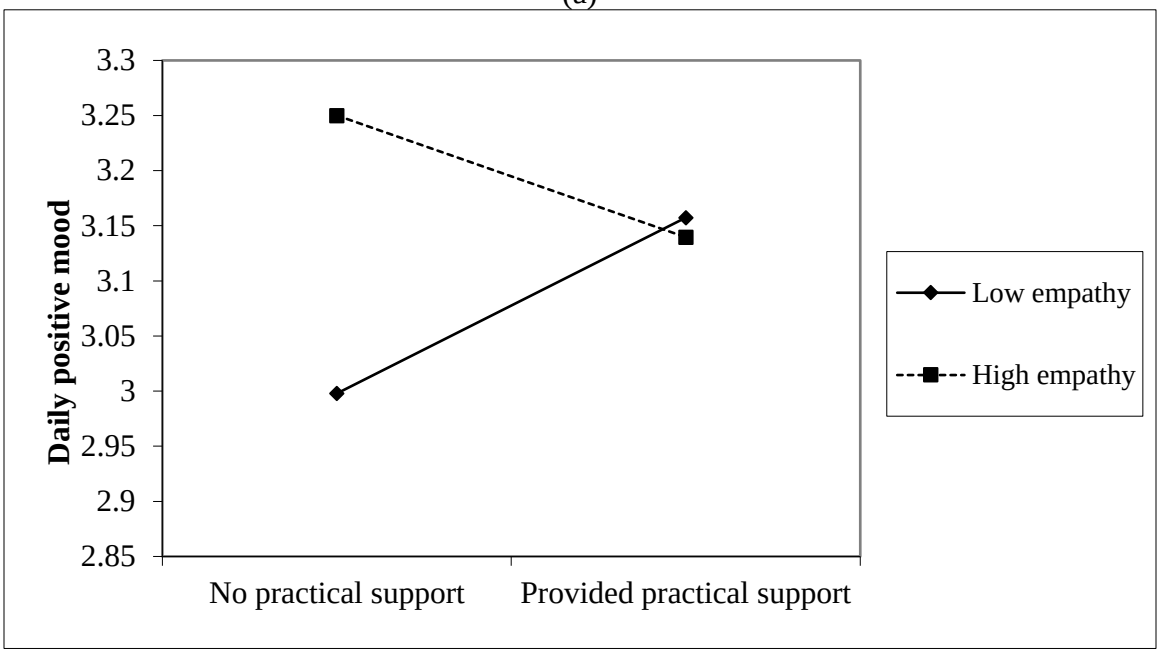
	Positive mood				**Negative mood**			
	Providing support		Receiving support		Providing support		Receiving support	
Variable	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*
Fixed effects								
Intercept	3.04***	0.68	2.86***	0.67	1.23***	0.37	1.20**	0.37
Participant empathy[a]	0.04	0.07	0.04	0.07	0.00	0.04	-0.01	0.04
Emotional support[b]	-0.05	0.03	0.01	0.03	0.05*	0.02	0.10***	0.03
Emotional support[b] × Empathy[a]	0.14**	0.04	-0.02	0.05	0.02	0.04	-0.04	0.04
Instrumental support[b]	0.01	0.03	0.11***	0.03	0.06*	0.02	0.00	0.03
Instrumental support[b] × Empathy[a]	-0.12**	0.04	-0.05	0.05	-0.01	0.04	0.00	0.04
Advice[b]	0.02	0.03	-0.05	0.03	0.00	0.02	0.03	0.03
Advice[b] × Empathy[a]	-0.01	0.05	0.09	0.05	-0.04	0.04	0.02	0.04
Covariates								
Age	-0.01	0.01	-0.01	0.01	-0.00	0.00	0.00	0.00
Gender[c]	-0.07	0.09	-0.04	0.09	0.06	0.05	0.07	0.05
Education[d]	-0.15	0.09	-0.17	0.09	0.00	0.05	-0.00	0.05
Self-rated health[e]	0.10*	0.04	0.10*	0.04	-0.08**	0.02	-0.07**	0.02
Relationship status[f]	0.21*	0.09	0.20*	0.09	-0.11*	0.05	-0.10*	0.05
Minority status[g]	0.15	0.09	0.14	0.09	-0.08	0.05	-0.08	0.05
Agreeableness[h]	0.30**	0.09	0.32***	0.09	-0.00	0.05	-0.01	0.05
Neuroticism[i]	-0.11	0.06	-0.11	0.06	0.18***	0.03	0.18***	0.03
# of partners with problems[j]	0.00	0.02	0.00	0.02	0.02	0.01	0.02	0.01
Random effects								
Intercept VAR	0.41***	0.04	0.40***	0.04	0.11***	0.01	0.10***	0.01
Residual VAR	0.11***	0.01	0.11***	0.01	0.09***	0.00	0.09***	0.00
-2 log likelihood	1532.5		1534.4		1049.2		1039.2	

Note. Older adults n = 293, Days n = 1,151. Outcome variables were participants' peak positive mood and negative mood each day.

[a]Averaged ratings of five empathy items on 1 (*not at all*), 2 (*a little bit*), 3 (*somewhat*), 4 (*quite a bit*), and 5 (*a great deal*). [b]Participants provided (or received) emotional support, instrumental support, or advice to any social partner this day on 1 (*yes*) and 0 (*no*). [c]Rated as 1 (*male*) and 0 (*female*). [d]Recoded as 1 (*college degree or above*), and 0 (*below college degree*). [e]Rated from 1 (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) to 5 (*excellent*). [f]Recoded as 1 (*married/remarried/cohabiting*), and 0 (*divorced/widowed/separated/never married*). [g]Recoded as 1 (*a racial or ethnic minority*) and 0 (*not a minority*). [h]Averaged ratings of five agreeableness items (e.g., considerate) on 1 (*not at all*), 2 (*a little bit*), 3 (*somewhat*), 4 (*quite a bit*), and 5 (*a great deal*). [i]Averaged ratings of four neuroticism items (e.g., nervous) on 1 (*not at all*), 2 (*a little bit*), 3 (*somewhat*), 4 (*quite a bit*), and 5 (*a great deal*). [j]Number of social partners who had at least one life problem (e.g., health concerns, emotional problems, financial problems, etc.).
*$p < .05$. **$p < .01$. ***$p < .001$.



(a)



(b)

Figure 1: Interaction effects of empathy × support provision to social partners on older adults' positive mood on a daily basis

Two figures represent: (a) providing emotional support and (b) providing instrumental support. High empathy represents 1 SD above the mean empathy and low empathy represents 1 SD below the mean empathy.

POST HOC TESTS

I also re-estimated all analyses to explore the potential moderating effect of participant gender. For models testing links between empathy and daily support exchanges, I included an interaction term of empathy × gender. Findings revealed no significant interaction effects. For models examining whether empathy moderated links between daily support exchanges and daily mood, I assessed three-way interactions of empathy × support exchanges × gender. These findings did not show significant interaction effects either.

Study 2 Discussion

This is the first study that assesses whether and in what ways older adults' empathy may influence their daily support exchanges with close partners and their own daily mood. Findings revealed that overall more empathic older adults were more involved with close partners than less empathic older adults. Older adults' empathy also had differential implications for the links between support exchanges and daily mood.

OLDER ADULTS' EMPATHY AND DAILY SUPPORT EXCHANGES

Findings offer additional evidence for the empathy-altruism hypothesis (Batson, 2011), in that more empathic older adults provided each type of support (i.e., emotional, instrumental, advice) more often than less empathic older adults. I did not expect empathy to facilitate advice giving but this study suggests that more empathic adults provide more help in a variety of settings. Although advice can be undesired in close ties (Gleason & Iida, 2015; Thoits, 2011), more empathic older adults are typically more

willing to devote time and energy to their social partners. These older adults may offer advice in a less intrusive way than less empathic older adults. This study expands the literature on older adults' empathy by capturing real-life experiences and including a variety of types of support that older adults exchange with social partners.

Also adding to the literature, this study found that more empathic older adults received more emotional support but did not differ in their receipt of instrumental support or advice. This may be due to more empathic older adults' greater sensitivity to emotional information. Emotional support can be subtle, with a social partner offering a nice gesture or comment may or may not be interpreted as emotional support. A recent experiment revealed that more empathic individuals manifest fewer eye blinks when viewing emotional stimuli, which indicates their more efficient and automatic processing of others' emotions than less empathic individuals (Kang et al., 2017). Thus, more empathic older adults may be more likely to detect that their partners have provided emotional support than less empathic older adults.

Older Adults' Empathy and Implications for Daily Mood

I also explored whether and how older adults' empathy may influence the implications of their support exchanges for their own daily mood. Overall, more empathic older adults seem to maintain their mood regardless of their support exchanges whereas less empathic older adults experience ups and downs in their mood when providing emotional and instrumental support.

Surprisingly, more empathic older adults did not differ in their mood on days when they provided emotional or instrumental support compared to days when they did not support. It may be that for more empathic older adults, offering support has become a routine and does not necessarily influence their mood. Indeed, prior research has shown that repeated exposure to certain stimuli may reduce individuals' emotional reactivity to these stimuli, which allows them to return to their usual and stable level of mood (Diener, Lucas, & Scollon, 2006; Grissom & Bhatnagar, 2009). In addition, more empathic older adults' helping behaviors may lead to some other positive consequences that are not included in this study. For example, given the better-quality support that more empathic older adults typically offer (Verhofstadt et al., 2008, 2016), they may improve their social partners' welfare more effectively, which can strengthen emotional bonds between the two parties. This study did not assess relationship qualities on a daily basis but future research may test this possibility.

Yet, empathy does seem to serve as a buffer when older adults provide emotional support, in that less empathic older adults incurred declines in positive mood on days when they provided emotional support. Less empathic older adults offer emotional support less often than their more empathic counterparts and they may view it as something that they are not used to or a situation where they lack control. Also, because less empathic older adults are less attuned to their social partners' emotions, they may say something awkward or act intrusively in emotional situations (Batson, 2011; Ickes & Hodges, 2013). As such, less empathic older adults' emotional support may cause

conflicts with their social partners, which in turn also reduce their mood on that day (Oakley et al., 2011).

Importantly, less empathic older adults do not always suffer when providing support. I found that less empathic older adults reported increased positive mood on days when they provided instrumental support. Prior research has often associated low empathy with behavioral withdrawal and isolation (Decety & Lamm, 2009); yet, this may not be the case when older adults interact with their close partners. Carstensen's socioemotional selectivity theory posits that older adults place strong values on close partners (Carstensen, 2006). Thus, support provision may be inevitable in these emotionally-connected bonds. Less empathic older adults may show deficits in understanding others' emotions and providing instrumental support may offer them a more feasible way to stay involved with close partners. Yet, this notion should be interpreted with caution, because I did not ask explicitly whether less empathic older adults provided instrumental support as a compensation. Future research may explore a potential compensatory mechanism between different types of support exchanges.

LIMITATIONS AND IMPLICATIONS

There are several limitations in this study. The current sample included older adults from diverse racial and lower educational backgrounds. Thus, I incurred difficulties when measuring older adults' empathy using reverse-scored items. I ended up excluding reverse-coded items to assure the validity of the empathy scale; yet, doing so may introduce some bias in this measure. Also, older adults in this study offered daily

reports for 4 days on average. I kept the intensive data collection short to avoid fatigue – our participants also engaged in ecological momentary assessments every 3 hours throughout the day. To rule out spurious findings, future studies may include more days when examining older adults' daily support exchanges.

Moreover, I only considered older adults' empathy. Support exchanges involve two parties and it is important to examine the social partner's empathy. For example, older adults may receive greater appreciation when helping a more empathic social partner than a less empathic partner (Booker & Dunsmore, 2016; Breen et al., 2010). When providing support to a less empathic partner with less gratitude, more empathic older adults may also find it more acceptable and less irritating. One possible direction for future research may be to track older spouse's empathy and daily support exchanges with a dyadic approach.

The current study extends prior research by adding empathy to the literature examining older adults' helping behaviors and also carries practical implications for interventions. I documented individual differences in older adults' empathy and their daily support exchanges with close partners, and also explored same-day consequences of these exchanges. Being empathic is beneficial, which may shed light on interventions targeting older adults with weaker ties and poorer well-being. Indeed, improving older adults' empathy may facilitate their involvement with close partners and help them maintain relatively stable mood in social experiences. Interestingly, although less empathic older adults may be somewhat isolated given their low engagement in support exchanges, they still benefit from helping closer partners. This finding may offer new

insights into training less empathic older adults to be more socially engaged (perhaps by offering help to close partners). For example, less empathic older adults may feel more comfortable offering instrumental support. Thus, intervention practitioners may work on improving the quality of instrumental support that less empathic older adults can offer, which may then strengthen these older adults' social engagement.

STUDY 3: DOES EMPATHY HAVE A COST?: OLDER ADULTS' EMPATHY AND SOCIAL PARTNERS EXPERIENCING PROBLEMS

Study 3 Abstract

Empathy underlies older adults' awareness and responses to their social partners' needs, but it is unclear whether such awareness is beneficial or harmful to older adults' well-being. I examined whether older adults' empathy was associated with having encounters with social partners incurring problems and their own well-being throughout the day. Participants were adults aged 65+ from the Daily Experiences and Well-being Study. These older adults (n = 313) rated empathy and indicated social partners' problems (e.g., health, emotional and financial problems) in a baseline interview. They also reported encounters with social partners and their mood every 3 hours over 5 to 6 days. Multiple regressions showed that more empathic older adults reported a greater proportion of social partners with major life problems than less empathic older adults. Older adults' empathy was not associated with their contact or negative encounters with social partners experiencing problems. Multilevel models revealed that encounters with these social partners had negative consequences for older adults' mood throughout the day; however, these consequences were reduced in more empathic older adults. This study emphasizes the importance of empathy in late life and refines our understanding of older adults' social lives and well-being. Findings carry implications for interventions that aim to protect older adults' well-being when their close others incur crises.

Key words: Empathy, Problems, Mood, Ecological Momentary Assessments

Study 3 Introduction

Empathy, the ability to share and understand others' emotions, is critical to individuals' social ties and well-being (Decety & Svetlova, 2012). Because older adults place strong values on their ties to social partners (family and friends, Charles & Carstensen, 2010), empathy may be especially important in late life. Empathy may enable older adults to attend to social partners' needs and help in response to those needs. Older adults typically have social partners suffering major life problems (e.g., a disabled spouse, a divorced child or a depressed friend; Fingerman, Huo, Graham, Kim, & Birditt, 2017; Kiecolt-Glaser & Wilson, 2017). More empathic older adults may be more aware of these problems and more likely to reach out to their social partners in everyday encounters. It is less clear, however, whether the link between these encounters and older adults' well-being varies by their empathy. Prior literature documented positive aspects of empathy (Caprara et al., 2012; Decety & Svetlova, 2012), but I also consider costs of empathy. For example, more empathic older adults may report greater emotional suffering by sharing their partners' distress (Decety & Lamm, 2009; Hodges & Biswas-Diener, 2007).

Charles's (2010) Strength and Vulnerability Integration model posits that when older adults cannot avoid distress (as when more empathic older adults have encounters with social partners who have problems), they may report worse mood due to a prolonged recovery from that distress. I asked whether older adults' empathy was associated with (a) social partners' problems, (b) contact and negative encounters with these partners throughout the day, and (c) their mood when encounters occurred. Findings may carry

implications for therapies and interventions, with regard to helping older adults cope with their social partners' problems while also protecting their own well-being.

OLDER ADULTS' EMPATHY AND SOCIAL PARTNERS EXPERIENCING PROBLEMS

I examined empathy as a personality-like trait that varies between individuals, which may explain the different ways older adults interact with their social partners having problems. Theories posit that empathy is a multifaceted construct including emotional and cognitive components, both of which are crucial for more empathic individuals to share others' emotions and take action more readily (de Waal, 2008; Preston & de Waal, 2002). The empathy-altruism hypothesis further argues that more empathic individuals care more about their social partners' welfare and feel more motivated to help (Batson, 2011). I drew on this model to examine how individual differences in empathy shape older adults' exposure and encounters with social partners experiencing problems.

Exposure to social partners experiencing problems

Empathy may influence older adults' exposure to their social partners' problems. Following the empathy-altruism hypothesis (Batson, 2011), more empathic older adults are more motivated to keep an eye on their social partners' everyday life. These older adults may be more aware when their social partners incur problems and less likely to abandon these partners during crises. In addition, social partners having problems may prefer disclosing problems to more empathic adults. Research suggests that more empathic individuals are more willing to devote time to social partners and offer more

effective help (Batson, 2011; Verhofstadt et al., 2008, 2016). Thus, I expected more empathic older adults would report more social partners having problems than less empathic older adults. More empathic older adults may not necessarily have more social partners with problems; rather, they may just know more about these problems.

Encounters with social partners experiencing problems

I then examined whether empathy increases older adults' contact with social partners having problems. More empathic older adults may engage in such contact more often, presumably in the hope of improving these partners' situations (Batson, 2011). Granted, some research suggests that more empathic individuals may reduce contact to avoid sharing others' distress (Decety & Lamm, 2009; Eisenberg & Eggum, 2009). Yet, this may not be the case in older adults' ties with close social partners (Charles & Carstensen, 2010). Rather, more empathic older adults may reach out to their social partners suffering problems (or social partners feel more comfortable turning to these more empathic adults), offering companionship or lending a listening ear to these partners (e.g., Einolf, 2009; Hoffman, 2008; Huo et al., 2019). I expected more empathic older adults to have more frequent contact with social partners incurring problems than less empathic older adults.

Moreover, I asked whether empathy influenced older adults' negative encounters with these social partners. Research suggests that individuals have more negative encounters with their family members incurring troubles (Birditt, Kim, Zarit, Fingerman, & Loving, 2016; Seltzer et al., 2009). Nevertheless, more empathic individuals show

greater understanding for their social partners' misfortunes; they are more likely to help solve problems than blaming or arguing with these partners (Batson, 2011; Carlo et al., 2012; Rizkalla et al., 2008). I tested this link in older adults and expected more empathic older adults were less likely to have negative encounters with social partners incurring problems. Given that more empathic older adults may have more contact with these partners in total, I asked whether more empathic older adults had a smaller proportion of negative encounters.

OLDER ADULTS' EMPATHY AND IMPLICATIONS OF ENCOUNTERS FOR MOOD

Older adults suffer when they interact with social partners incurring problems in a daily context (Bourassa, Memel, Woolverton, & Sbarra, 2015; Kiecolt-Glaser & Wilson, 2017; Pillemer, Suitor, Riffin, & Gilligan, 2017). In parent-child ties, studies examined midlife parents and found spending time and having negative encounters with children who have problems are associated with elevated levels of cortisol on the same and next days (Birditt et al., 2016; Seltzer et al., 2009). In older couples, interacting with a depressed, sick or stressed spouse is demanding and associated with worse daily mood (Kiecolt-Glaser & Wilson, 2017; Roper & Yorgason, 2009). Yet, these links may vary by older adults' empathy. I examined positive and negative mood as well-being outcomes throughout the day and considered competing hypotheses.

In line with the literature regarding positive aspects of empathy, more empathic older adults may find it rewarding to interact with social partners having problems. These older adults may engage in helping behaviors and problem solving during these

encounters, which may improve their social partners' situations and alleviate these partners' distress (Batson, 2011; Carlo et al., 2012; Rizkalla et al., 2008; Sze, Gyurak, Goodkind, & Levenson, 2012; Verhofstadt et al., 2008, 2016). Thus, even during negative encounters with social partners suffering problems, being empathic may still protect older adults' mood (i.e., maintain or increase positive mood and reduce negative mood). This may also be true when compared to negative encounters with social partners who did not have problems. Indeed, more empathic older adults may have different attributes to negative encounters with different social partners; they perhaps believe their social partners suffering problems need help and are less likely to be angry at them.

I also asked whether empathy had a cost (i.e., reduce older adults' well-being). A burgeoning literature suggests that sharing others' negative emotions can lead to distress or emotional burnout (Decety & Lamm, 2009; Eisenberg & Eggum, 2009; Oakley et al., 2011). More empathic older adults may pay greater attention to their social partners' misfortunes and perceive their distress more accurately (Eisenberg & Eggum, 2009; Hoffman, 2008). It is possible that contact and negative encounters with social partners having problems burden empathic older adults more than their less empathic counterparts (i.e., increase negative mood and decrease positive mood).

OTHER FACTORS AND THE CURRENT STUDY

I considered factors including older adults' age, gender, physical health, education, minority and relationship status. Older and healthier adults report better well-being (Charles, 2010; Charles & Carstensen, 2010). Women are more empathic than men

(Beadle et al., 2015; O'Brien et al., 2013). Education is positively associated with empathy (Grühn et al., 2008). African Americans are more reactive to stressors and report poorer well-being than European Americans (Cichy et al., 2012; Rosenfield, 2012). More empathic people tend to stay in intimate relationships and married or cohabiting people are often happier (Cramer & Jowett, 2010; Rendall et al., 2011).

I also included agreeableness and neuroticism. Empathy may explain why more agreeable people get along with others better than less agreeable people (Graziano et al., 2007; Haas et al., 2015). Neuroticism is associated with low empathy (Mooradian et al., 2011) and greater daily negative affect (Robinson et al., 2007; Roelofs et al., 2008).

This study tested the following hypotheses:

H1: I expected more empathic older adults to report more social partners having problems than less empathic older adults.

H2a: I expected more empathic older adults to have more frequent contact with their social partners having problems than less empathic older adults.

H2b. When in contact with social partners having problems, I expected more empathic older adults to have fewer negative encounters than less empathic older adults.

H3. I tested competing hypotheses regarding whether empathy maintained or reduced older adults' mood when they had encounters with social partners having problems.

Study 3 Methods

Participants were from the Daily Experiences and Well-being Study which

occurred in 2016–2017 (Fingerman, Huo, Charles, & Umberson, 2019). The University of Texas at Austin Institutional Review Board approved all procedures (2015-02-0123). We recruited 333 community-dwelling adults aged 65+ in the greater Austin, Texas. The screening procedure selected older adults who did not have cognitive impairment and were not employed for pay over 20 hours a week. We oversampled male and minority participants to obtain a diverse sample. Although this sample was better educated than the older population in this area (U.S. Census Bureau, 2017), we included participants from the full spectrum of socioeconomic statuses.

Participants first completed 2-hour face-to-face interviews, during which they offered their background characteristics and listed social partners using three concentric convoy circles (Antonucci, 1986; see Appendix). Names of the 10 closest social partners (first name and last initial) were entered into ecological momentary assessments (i.e., EMA, Shiffman, Stone, & Hufford, 2008) on Android devices provided by the study. Participants received in-depth training on filling out these assessments. EMA captured participants' behaviors and experiences every 3 hours throughout the day across 5 to 6 days (2 weekend days and 2 or 3 weekdays). We individualized these assessments for participants to indicate their encounters with each social partner. Participants also reported on their own mood in these assessments.

All participants were invited to complete EMA and 313 participants provided data for analysis (*m = 20 assessments*, n = 6,262 assessments). These participants were less likely to be minority ($\chi^2 = 7.19$, $p = .007$) but did not differ in other characteristics from the other 20 participants. Participants received $50 for the interview and another $100 for

the EMA.

INTERVIEW MEASURES

Participant empathy

Participants rated their empathy using five items out of the original 8-item scale. The scale was modified from the Interpersonal Reactivity Index, a widely used measure of individual differences in empathy (empathic concern and perspective taking subscales; Davis, 1983). Participants rated how much each of the statements described them from 1 (*not at all*) to 5 (*a great deal*). Example items included: "I often have tender, concerned feelings for people less fortunate than me" and "I sometimes try to understand other people better by imagining how things look from their perspective". Three statements were reverse-coded such as, "Sometimes I do not feel sorry for other people when they are having problems". Interviewer notes and recordings revealed that most participants reported difficulties in understanding these items. Thus, I excluded these three items and instead used a 5-item scale in analyses. I averaged participants' ratings across the five items (α = .73).

Participant characteristics

Participants reported their age in years, gender as 1(*male*) and 0 (*female*), physical health as 1 (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) and 5 (*excellent*; Idler & Kasl, 1991), education as 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*) and 8 (*advanced degree*), and marital status

dichotomized as 1 (*married/remarried/cohabiting*), and 0 (*divorced/widowed/separated/never married*). I recoded minority status as 1 (*ethnic/racial minorities*) and 0 (*non-Hispanic Whites*) based on participants' ethnic and racial identities. Among participants who self-identified as minorities (n = 109), 51% of these participants were Latinx Americans and 49% were African Americans. As for agreeableness and neuroticism, I used validated personality measures from the Midlife in the United States (MIDUS) which is a national study of adults aged 25 to 74. Participants rated how well each of the five agreeableness items (helpful, warm, softhearted, sympathetic, caring; Mroczek & Almeida, 2004) described them from 1 (*not at all*) to 4 (*a lot*). They also rated the four neuroticism items (e.g., moody, nervous; Lachman & Weaver, 1997) from 1 (*not at all*) to 5 (*a great deal*). I averaged the ratings across items to measure agreeableness (α = .77) and neuroticism (α = .70).

Social partners

Participants named members in their social networks. In three concentric circles (Antonucci, 1986), they listed social partners: (a) that they feel so close to, it is hard to imagine life without them, (b) to whom they may not feel quite that close, but who are still very important, and (c) whom they have not already mentioned but who are close enough and important enough in their lives that these social partners should also be included. Participants had 15.09 social partners (*range* = 0 to 30, primarily family and friends), which is higher than in other older adult samples (e.g., m = 11.30 in Ajrouch et al., 2018; m = 10.82 in Fiori, Smith, & Antonucci, 2007). To avoid fatigue, participants

specified characteristics of up to 10 closest social partners (Fiori et al., 2007).

Social partner life problems

Participants indicated whether each social partner incurred seven life problems during the past year (Fingerman, Miller, Birditt, & Zarit, 2009). The problems were (a) health problem/injury, (b) psychological problem, (c) drug or alcohol problem, (d) financial problem, (d) loss of a close friend, (e) the victim of a crime, and (f) housing/neighborhood problem. Due to skewed distributions of problems, I recoded a variable to measure 1 (*this social partner had at least one problem*) and 0 (*this social partner did not have any problems*). I calculated the proportion of social partners experiencing problems.

ECOLOGICAL MOMENTARY ASSESSMENT MEASURES

Encounters

Every 3 hours, participants reported whether they had any contact with each social partner as 1 (*yes*) and 0 (*no*). If they had an encounter, participants also indicated: (a) whether they discussed anything stressful on 1 (*yes*) or 0 (*no*), and (b) how pleasant this encounter was from 1 (*unpleasant*), 2 (*a little unpleasant*), 3 (*neutral*), 4 (*a little pleasant*) to 5 (*pleasant*). I recoded the second indicator as 1 if the encounter was at least a little unpleasant (score of 1 or 2) or 0 if they were not unpleasant (scores 3 through 5). Then I generated an indicator such that encounters were coded as negative if they involved discussing anything stressful and/or were considered unpleasant. In total, only 2% of encounters involved discussing something stressful but were not viewed as

unpleasant.

Encounters with social partners suffering problems

Using the variable indicating whether each social partner had at least one life problem, I generated two variables: (a) 1 (*participants had contact with social partners suffering problems during the past 3 hours*) and 0 (*participants did not have contact with social partners suffering problems during the past 3 hours*), as well as (b) 1 (*participants had negative encounter with social partners suffering problems during the past 3 hours*) and 0 (*participants did not have negative encounter with social partners suffering problems during the past 3 hours*). I also calculated two proportions for analysis: (a) the proportion of 3-hour assessments in which older adults had contact with social partners having problems out of all assessments involving contact, and (b) the proportion of 3-hour assessments in which older adults had negative encounters with social partners having problems out of all assessments involving contact with these social partners.

Mood

Participants rated the extent to which they experienced three positive emotions (content, loved, calm) and five negative emotions (nervous/worried, irritated, bored, lonely, sad; Fingerman et al., 2016; Piazza, Charles, Stawski, & Almeida, 2013). Responses were coded from 1 (*not at all*) to 5 (*a great deal*). I calculated averages to measure positive (α = .73) and negative mood (α = .72) for each participant at each 3-hour assessment.

ANALYTIC STRATEGY

All models adjusted for participant age, gender, education, health, relationship status, minority status, agreeableness, and neuroticism. I first examined whether more empathic older adults reported a greater proportion of social partners who had problems than less empathic older adults. I estimated a multiple regression, where participants' empathy was the predictor and the proportion of social partners with problems was the outcome.

I then tested whether more empathic older adults had more contact but fewer negative encounters with social partners incurring problems throughout the day. I estimated two multiple regressions, predicting the proportion of assessments older adults had (a) contact and (b) negative encounters with social partners incurring problems. The predictor was empathy.

Lastly, I examined whether empathy moderated the associations between contact/negative encounters with social partners suffering problems and mood. I estimated three-level models using SAS PROC MIXED due to nested data. The 3-hour report (*level 1*) was nested within each day (*level 2*), which was nested within each participant (*level 3*). Predictors were whether participants had (a) contact with social partners having problems as 1 (*yes*) or 0 (*no*), and (b) negative encounter with these social partners as 1 (*yes*) or 0 (*no*); predictors were analyzed in separate models. Positive and negative mood every 3 hours were outcomes in separate models (four models). To test whether these links varied by empathy, I included interaction terms between empathy (centered on the sample mean) and the social encounter variables. In the interview, 74%

of participants (n = 229) reported having both social partners with problems and partners without problems. Thus, I controlled for whether participants had contact or negative encounters with social partners not experiencing problems in the same 3-hour interval in the same models. I explored significant interactions with simple slopes analysis.

Study 3 Results

The vast majority (77%, n = 241) of participants had at least one social partner experiencing problems. These participants did not differ from the other 72 participants without social partners experiencing problems in any characteristics. Participants had contact during the majority of assessments (89%) and had negative encounters during about one-fifth of all the assessments. I present bivariate correlations in Table 10.

HYPOTHESES TESTING

Exposure and encounters with social partners experiencing problems

As expected, older adults' empathy was associated with a greater proportion of social partners having problems (B = 0.04, p = .04; Table 11). I also expected more empathic older adults to have more contact and fewer negative encounters with these social partners. Yet, older adults' empathy was not significantly associated with having contact (B = 0.02, p = .43) or negative encounters (B = -0.00, p = .93) with these social partners (not in table).

Table 10: Descriptive Information of Participants (n = 313) and Correlations between Measures

Characteristics	*M*	*SD*	1.	2.	3.	4.	5.	6.	7.
1. Age	73.94	6.38	–						
2. Education[a]	5.88	1.61	-0.07	–					
3. Health[b]	3.56	1.02	-0.04	0.30***	–				
4. Empathy[c]	3.77	0.66	-0.07	0.12*	0.01	–			
5. Agreeableness[d]	3.46	0.48	-0.03	-0.03	0.01	0.33***	–		
6. Neuroticism[e]	2.42	0.69	-0.13*	-0.09	-0.25***	-0.05	-0.13*	–	
7. % of assessments involving contact with social partners who had problems[f]	0.45	0.42	-0.01	0.05	-0.11*	0.08	0.12*	0.13*	–
8. % of assessments involving negative encounters with social partners who had problems[g]	0.22	0.26	-0.10	0.09	0.04	-0.02	-0.13	0.04	-0.08
9. Positive mood[h]	3.47	0.80	-0.10	-0.03	0.09	0.13	0.23***	-0.09	0.05
10. Negative mood[h]	1.21	0.39	-0.03	-0.02	-0.22	0.05	-0.04	0.37***	0.14*
	Proportion								
11. Females	.56		0.02	0.17**	0.04	-0.12*	-0.27***	0.02	-0.05
12. Relationship status[i]	.59		-0.23***	0.16**	0.03	-0.02	-0.12*	0.14*	-0.02
13. Minority[j]	.31		-0.12*	-0.36**	-0.35***	0.01	0.03	0.14*	0.03
14. Partners with problems[k]	.77		0.05	0.05	0.03	0.05	0.08	0.06	0.64***

Table 10 Continued: Descriptive Information of Participants (n = 313) and Correlations between Measures

Characteristics	*M*	*SD*	8.	9.	10.	11.	12.	13.	14.
1. Age	73.94	6.38							
2. Education[a]	5.88	1.61							
3. Health[b]	3.56	1.02							
4. Empathy[c]	3.77	0.66							
5. Agreeableness[d]	3.46	0.48							
6. Neuroticism[e]	2.42	0.69							
7. % of assessments involving contact with social partners who had problems[f]	0.45	0.42							
8. % of assessments involving negative encounters with social partners who had problems[g]	0.22	0.26	–						
9. Positive mood[h]	3.47	0.80	-0.15*	–					
10. Negative mood[h]	1.21	0.39	0.37***	-0.07	–	–			
	Proportion								
11. Females	.56		-0.05	-0.05	-0.02	–			
12. Relationship status[i]	.59		-0.01	0.04	-0.04	0.40***	–		
13. Minority[j]	.31		-0.20**	0.07	0.02	-0.00	-0.01	–	
14. Partners with problems[k]	.77		0.09	0.02	0.11	-0.09	-0.06	-0.06	–

Note. Data source: Daily Experiences and Well-being Study.

[a]1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*). [b]1 (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), and 5 (*excellent*). [c]Averaged ratings of five items from 1 (*not at all*) to 5 (*a great deal*). [d]Averaged ratings of five agreeableness items (e.g., helpful, considerate) on 1 (*not at all*), 2 (*a little bit*), 3 (*somewhat*), 4 (*a lot*). [e]Averaged ratings of four neuroticism items (e.g., moody, nervous) on 1 (*not at all*), 2 (*a little bit*), 3 (*somewhat*), 4 (*quite a bit*), and 5 (*a great deal*). [f]Percentage of assessments involving contact with social partners who had problems (n = 2,280), out of assessments involving any contact. [g]Percentage of assessments involving negative encounters with social partners who had problems (n =

430), out of all assessments involving contact with these social partners. [h]Averaged ratings of four positive items (e.g., calm, proud) and five negative items (e.g., nervous, irritated) from 1 (*not at all*) to 5 (*a great deal*). [i]Coded as 1 (*married/remarried/cohabiting*), and 0 (*divorced/widowed/separated/never married*). [j]Coded as 1 (an ethnic or *racial minority*), and 0 (*not a minority*). [k]Percentage of participants who had at least one social partner with problems.

Table 11: Multiple Regression Predicting the Proportion of Social Partners Experiencing Problems from Participant Empathy

	Without Covariates		With Covariates	
Parameter	*B*	*SE*	*B*	*SE*
Intercept	0.04	0.07	-0.10	0.22
Participant empathy[a]	0.06**	0.02	0.04*	0.02
Covariates				
Age	–	–	0.00	0.00
Gender[b]	–	–	-0.03	0.03
Education[c]	–	–	0.02	0.01
Self-rated health[d]	–	–	-0.03*	0.01
Relationship status[e]	–	–	-0.06	0.03
Minority status[f]	–	–	-0.01	0.03
Agreeableness[g]	–	–	0.04	0.03
Neuroticism[h]	–	–	0.04*	0.02
F	8.55**		3.45***	
Adjusted R^2	.02		.06	

Note. Data source: Daily Experiences and Well-being Study. Participants *n* = 313, social partners *n* = 4,724.

[a]Averaged ratings of five empathy items on 1 (*not at all*), 2 (*a little bit*), 3 (*somewhat*), 4 (*quite a bit*), and 5 (*a great deal*). [b]1 (*male*) and 0 (*female*). [c]1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college (no additional degree)*), and 8 (*advanced degree*). [d]1 (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), and 5 (*excellent*). [e]1 (*married/remarried/cohabiting*), and 0 (*divorced/widowed/separated/never married*). [f]Coded as 1 (*racial or ethnic minority*) and 0 (*not a minority*). [g]Averaged ratings of five agreeableness items (e.g., helpful, considerate) on 1 (*not at all*), 2 (*a little bit*), 3 (*somewhat*), 4 (*a lot*). [h]Averaged ratings of four neuroticism items (e.g., moody, nervous) on 1 (*not at all*), 2 (*a little bit*), 3 (*somewhat*), 4 (*quite a bit*), and 5 (*a great deal*).

*p < .05. **p < .01. ***p < .001.

Implications for mood

I explored whether empathy had benefits or costs on older adults' mood. I expected older adults' empathy to maintain or reduce their mood when they had contact or negative encounters with social partners incurring problems. I found one interaction of empathy × negative encounters on older adults' positive mood ($B = 0.10$, $p < .001$; Table 12). Simple slopes analysis (Figure 2) revealed that older adults reported reduced positive mood when they had negative encounters with social partners incurring problems; however, this link was weaker in more empathic older adults ($B = -0.06$, $p < .05$) compared to less empathic older adults ($B = -0.20$, $p < .001$). There was no significant interaction of empathy and negative encounters on negative mood ($B = -0.03$, $p = .14$). I did not observe interactions involving contact on positive mood ($B = 0.03$, $p = .23$) or negative mood ($B = 0.00$, $p = .81$, not in tables).

Post hoc tests

I conducted lagged analyses to examine whether older adults' empathy influenced the lingering effect of older adults' encounters on their mood. I found one interaction: empathy × contact on older adults' negative mood ($B = -0.05$, $p = .005$). Simple slopes analysis revealed that after having contact with social partners experiencing problems, more empathic older adults reported reduced negative mood in the next few hours ($B = 0.04$, $p = .04$). Less empathic older adults, however, reported increased negative mood ($B = -0.03$, $p = .04$).

Table 12: Older Adults' Empathy Moderating the Link between Negative Encounters and Positive Mood throughout the Day

	Without Covariates		With Covariates	
Parameter	*B*	*SE*	*B*	*SE*
Intercept	3.45***	0.04	3.13***	0.64
Participant empathy[a]	0.17**	0.06	0.07	0.06
Negative encounters with partners having problems[b]	-0.14***	0.02	-0.13***	0.02
Empathy[a] × Negative encounters[b]	0.10**	0.03	0.10***	0.03
Covariates				
Negative encounters with partner not having problems[b]	–	–	-0.07***	0.02
Age	–	–	-0.01	0.01
Gender[v]	–	–	-0.01	0.09
Education[d]	–	–	-0.01	0.03
Self-rated health[e]	–	–	0.09***	0.01
Relationship status[f]	–	–	0.25**	0.09
Minority status[g]	–	–	0.04	0.09
Agreeableness[h]	–	–	0.39***	0.09
Neuroticism[i]	–	–	-0.17**	0.06
Random effects				
Intercept VAR (Level 2: Day)	0.05***	0.00	0.04***	0.00
Intercept VAR (Level 3: Participant)	0.46***	0.04	0.41***	0.04
Residual VAR	0.13***	0.00	0.13***	0.00
-2 log likelihood	7182.0		6940.9	

Note. Data source: Daily Experiences and Well-being Study. Participants n = 313, social partners n = 4,724.
[a]Averaged ratings of five empathy items on 1 (*not at all*), 2 (*a little bit*), 3 (*somewhat*), 4 (*quite a bit*), and 5 (*a great deal*). [b]1 (*had negative encounters with social partners (not) experiencing problems*), and 0 (*did not have negative encounters with social partners (not) experiencing problems*). [c]1 (*male*) and 0 (*female*). [d]1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college (no additional degree)*), and 8 (*advanced degree*). [e]1 (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), and 5 (*excellent*). [f]1 (*married/remarried/cohabiting*), and 0 (*divorced/widowed/separated/never married*). [g]Coded as 1 (*racial or ethnic minority*)

and 0 (*not a minority*). [h]Averaged ratings of five agreeableness items (e.g., helpful, considerate) on 1 (*not at all*), 2 (*a little bit*), 3 (*somewhat*), 4 (*a lot*). [i]Averaged ratings of four neuroticism items (e.g., moody, nervous) on 1 (*not at all*), 2 (*a little bit*), 3 (*somewhat*), 4 (*quite a bit*), and 5 (*a great deal*).
*$p < .05$. **$p < .01$. ***$p < .001$.

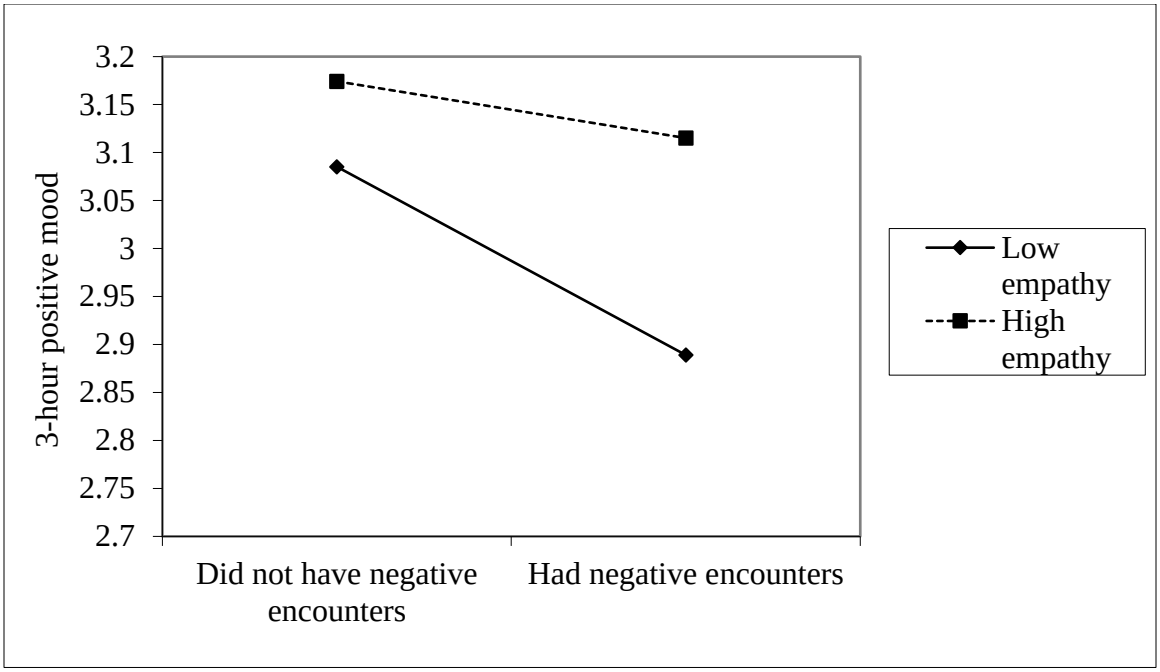


Figure 2: Interaction effects of empathy × negative encounters with social partners having problems on older adults' positive mood throughout the day.

Study 3 Discussion

A burgeoning literature examines the downside of empathy (e.g., Decety & Lamm, 2009; Eisenberg & Eggum, 2009; Manczak et al., 2016; Oakley et al., 2011), but this was the first empirical study that tested whether empathy reduces older adults' well-being when their family or friends suffer troubles. I found that more empathic older adults reported more social partners who had major life problems but did not have more encounters with these partners throughout the day. Encounters with social partners who had problems reduced older adults' mood; however, this link was weaker or even reversed in more empathic older adults. Findings identify a promising role that empathy may play in family therapies and interventions that protect older adults' emotional well-being when their social partners incur problems.

Older Adults' Empathy and Social Partners Experiencing Problems

I expected more empathic older adults to report more social partners with major life problems and found support to this hypothesis. More empathic older adults are more concerned about their social partners' welfare (Batson, 2011). As such, they be more likely to keep their social partners' needs in mind whereas less empathic older adults do not take others' problems seriously. It may also be that more empathic older adults over-estimate their social partners' suffering sometimes. I relied solely on older adults' reports of their social partners' problems and thus could not test these possibilities. Future research may include social partners' reports of their own problems and explore whether their disclosure of problems varies based on older adults' empathy levels.

I also expected more empathic older adults to engage in more contact and fewer negative encounters with social partners who had problems throughout the day. Surprisingly, I did not find these links. It is possible that empathy influences the content rather than the frequency of these encounters. Research suggests that more empathic individuals tend to engage in problem solving or helping behaviors (Carlo et al., 2012; Rizkalla et al., 2008). Likewise, more empathic older adults may spend time helping their social partners having problems (Huo et al., 2019) whereas less empathic older adults criticize these partners during their encounters. This interpretation requires further exploration with more detailed accounts of older adults' daily social encounters. Researchers may ask participants what they had discussed during encounters, or capture their conversations using auditory data.

OLDER ADULTS' EMPATHY AND IMPLICATIONS OF ENCOUNTERS FOR MOOD

I also raised competing hypotheses and asked how empathy was associated with older adults' mood during contact and negative encounters with social partners experiencing problems. Findings suggest that more empathic older adults are less reactive to their negative encounters with social partners having problems compared to less empathic older adults. This may be because more empathic older adults are better able to "stand in these social partners' shoes" and understand these partners' struggles. By contrast, less empathic older participants may blame their social partners for what these partners are suffering (Decety & Lamm, 2009; Oakley et al., 2011). Further, helping behaviors likely co-occur even when more empathic older adults have negative

encounters with their social partners having problems. They may focus on addressing their social partners' problems rather than ruminating about their social partners' problems (Batson, 2011; Carlo et al., 2012; Rizkalla et al., 2008).

I also explored lingering consequences of these encounters. Research showed that interacting with adult children who suffered problems negatively influenced midlife and older parents' emotional and physical well-being the next day (Barker, Greenberg, Seltzer, & Almeida, 2012; Birditt et al., 2016). I found that empathy reversed this link. More empathic older adults received lasting benefits from contact with their social partners experiencing problems whereas less empathic older adults suffered from such contact. More empathic older adults may utilize their everyday encounters to check in with their social partners' situations, which may bring these older adults comfort and emotional rewards.

LIMITATION AND IMPLICATIONS

Several limitations in this study warrant consideration. This study drew on a relatively small sample from a small geographic area of the United States, where older adults are highly educated. Yet, this is the most diverse sample available to examine older adults' daily experiences. Also, due to the complexity of the Daily Experiences and Well-being Study, our participants may be more social and positive than the general older population. I did not measure participants' own problems using the same items, but I adjusted for their education and health which are highly associated with life problems (Conger et al., 2010). I used older adults' self-reports of social experiences and well-

being, which may be positively biased. A daily diary study tracked participants aged 21 to 89 across 7 days and found that more empathic participants regarded their encounters as more positive and meaningful (Grühn et al., 2008). Researchers may measure social experiences in a more objective manner.

Future studies may examine negative aspects of empathy I failed to capture. For example, empathy may have a more salient negative effect in certain older adults. Scholars posit that empathy may be detrimental when individuals cannot regulate distress (Hodges & Biswas-Diener, 2007; Hoffman, 2008). Some older adults are exposed to chronic stressors (e.g., serving as a primary caregiver or incurring severe disability themselves) and they may have a harder time regulating the distress they share.

This study carries practical implications by identifying a promising role that empathy may play in family therapies and health-promotion interventions. Researchers have successfully improved young children's empathy via interventions (Eisenberg et al., 2010; Fonagy et al., 2009). Nevertheless, similar empathy training has rarely been implemented in older populations. Our findings emphasize that interventions targeting older adults should also incorporate empathy training to benefit their social experiences and well-being. Prior empathy trainings in younger populations have incorporated role playing with a virtual figure to understand others' emotions. Given that older adults prioritize their social ties with close family and friends, it may be more effective to train older adults' empathy in real-life settings. Most older adults have beloved social partners who incur major life problems, which likely hurts these older adults (Pillemer et al., 2017). Empathy training may focus on increasing older adults' awareness to their social

partners' problems and have the potential to improve their behaviors in response. For instance, training older adults' empathy may equip them with better skills to communicate with their social partners and offer help in a more considerate way (Batson, 2011; Huo et al., 2019). Moreover, increasing empathy, and the helping behaviors that accompany it, may build older adults' resilience in the face of social stressors.

In conclusion, this study extends the literature by showing how empathy shapes older adults' social experiences involving their friends and family who incur problems. I found that being empathic exposed older adults to a greater number of these social partners with problems and also protected their well-being during encounters with these partners. Findings offer new insights into family therapies and health-promotion interventions, emphasizing the importance of empathy in promoting successful aging.

GENERAL DISCUSSION

The current studies innovatively add the concept of empathy into the literature regarding older adults' social lives and well-being. Drawing on data from the *Daily Experiences and Well-being Study*, I examined older adults' social networks and their experiences with members in these networks throughout the day. Study 1 revealed that more empathic older adults exchanged support with a greater number of social partners (e.g., close friends and family) and also reported greater affection for these partners. Study 2 tested the link between older adults' empathy and support exchanges in a daily context and examined well-being consequences of these exchanges. Compared to less empathic older adults, more empathic older adults were better able to maintain their mood during support exchanges with their social partners. More empathic older adults likely offer more frequent support due to their awareness of social partners' needs and distress. Thus, study 3 asked whether such awareness had a cost on older adults' well-being. I found that being more empathic protected older adults' mood in everyday encounters with social partners suffering major life problems.

Taken together, findings suggest that empathy may play a crucial role in strengthening older adults' social connections and promoting successful aging. These studies advance our understanding of individual differences in older adults' social lives, which may help generate new interventions targeting older adults who incur social isolation or loneliness. In this general discussion, I highlight some key implications of these studies and point out limitations and also potential directions for future research.

EMPATHY AND SOCIAL EXPERIENCES

This dissertation offers evidence for the empathy-altruism hypothesis (Batson, 2011). This hypothesis posits that individuals who share others' feelings and experience concerns for others' welfare (i.e., individuals who are empathic) are motivated to offer help to others in need. Prior research has tested the link between empathy induced in the laboratory and older adults' financial support to strangers (e.g., donations or economic decisions; Beadle et al., 2015; Sze et al., 2012). Yet, research has rarely examined empathy and older adults' experiences with close family and friends (i.e., social partners). Here, I examined everyday support that older adults gave to their social partners in real-life settings. Overall, findings confirmed the link between empathy and helping behaviors in older adults' everyday live.

Studies 1 and 2 showed that more empathic older adults offered each type of support (e.g., emotional, practical, advice) more often and to more social partners. These results refine our understanding of older adults' helping behaviors with a focus on individual differences. It remains less clear, however, whether more empathic older adults help out in different ways compared to less empathic older adults. Previous studies in romantic couples suggest that more empathic individuals may offer help that is more considerate and effective to their spouse (Verhofstadt et al., 2008, 2016). Future studies may capture older adults' helping behaviors in more objective ways (e.g., how they help, what they say) and incorporate the recipients' evaluations of the help received.

Moreover, this empathy-altruism link likely co-occurs with more empathic older adults' greater awareness of their social partners' needs. Indeed, study 3 revealed that

more empathic older adults reported a greater number of social partners who suffered major life problems (e.g., health concerns, emotional problems, financial loss). These older adults probably know more about their social partners' problems because their partners are willing to confide those problems. More empathic older adults also likely pay greater attention to these partners' welfare. I had also predicted that more empathic older adults would have more frequent encounters with social partners who suffer problems. Yet, study 3 did not reveal such link. It is possible that empathy shapes the content rather than the frequency of older adults' social encounters. For example, more empathic older adults may be more likely to offer help during encounters with social partners suffering problems. Researchers may explicitly ask what occurs during these encounters to test this possibility.

Support is often exchanged between two parties but prior research on empathy has predominantly focused on support provision. I conducted the first two studies that explored the link between empathy and support receipt. Studies 1 and 2 showed that more empathic older adults received support more often and from a greater number of their social partners. I proposed several possible explanations. Compared to less empathic older adults, more empathic older adults may be more aware of the support they receive from others. This explanation may especially apply to emotional support, which can be subtle and interpreted differently across individuals. Indeed, a recent behavioral experiment revealed that more empathic individuals processed emotional information more automatically (Kang et al., 2016). In addition, social partners who receive a lot of support from more empathic older adults may feel more obligated to return such support

(Gleason & Iida, 2015). Study 1 tested support reciprocity explicitly and found that more empathic older adults were more likely to reciprocate support with their social partners. In addition, older adults may follow the homophily principle (McPherson, Smith-Lovin, & Cook, 2001) and retain ties with similar others (that is, friends and family who also score high in empathy). It will also be interesting to examine whether more empathic older adults are better at conveying their emotions and express their requests for support indirectly. All of these explanations necessitate the consideration of both parties when examining social experiences such as support exchanges.

Scholars argue that empathy plays a central role in successful social lives and the role may not be limited in support exchanges. In line with the Grühn et al. (2008), Study 1 revealed a positive link between older adults' empathy and affection for their social partners. Yet, it remains unclear whether empathy predicts affection or vice versa. Although Grühn and colleagues (2008) drew on longitudinal data, they did not model the link between empathy and positive relations with others over time. Grühn and colleagues also found that more empathic individuals viewed their encounters as more pleasant and meaningful. Thus, being more empathic may promote pleasantness in everyday encounters and increase closeness in older adults' social ties. Nevertheless, it is also possible that older adults in closer ties have an easier time to understand their social partners' thoughts and feelings. Researchers should conduct longitudinal studies to further examine the link between empathy and affection. Findings from longitudinal studies may speak to the idea of improving empathy to strengthen social ties.

EMPATHY AND EMOTIONAL WELL-BEING

As a key ability underlying strong social ties, empathy may also influence older adults' well-being. Scholars have predominantly viewed empathy as a positive construct (Caprara et al., 2012; Decety & Svetlova, 2012). Yet, a burgeoning literature has examined the downside of empathy, suggesting that empathy can lead to worry, rumination and emotional burnout (Hodges & Biswas-Diener, 2007; Hoffman, 2008; Klimecki & Singer, 2012). I proposed that empathy could place a cost on older adults' well-being under certain circumstances, such as when they offer emotional support and share social partners' distress. Findings from the current studies, however, did not suggest such detriments, but rather, revealed benefits of empathy even under those circumstances.

In Study 2, I tracked older adults' support exchanges with social partners and emotional mood on a daily basis. Findings showed that more empathic older adults maintained their mood regardless of whether they helped or not. Yet, less empathic older adults reported worse mood on days when they provided emotional support. More empathic older adults may view helping as a routine behavior in their lives and be able to maintain their mood regardless of whether they help or not (Diener et al., 2006; Grissom & Bhatnagar, 2009). Yet, less empathic older adults may be incompetent in showing comfort and care to others, which could burden them psychologically and also cause conflict with the others. Interestingly, less empathic older adults reported better mood on days when they offered practical help, which may be a more feasible way for these older adults to stay involved in close ties. Yet, the practical help that less empathic older adults

offer can be ineffective or even intrusive to their social partners. Moreover, Study 2 examined support exchanges reported at the end of each day. Thus, it is unclear whether older adults' support exchanges influence their mood or their mood facilitate or limit their support exchanges.

To take a closer look at older adults' empathy and well-being, Study 3 assessed how empathy influenced the link between older adults' social encounters and their own mood throughout the day. Study 3 focused on older adults' experiences with their family and friends who incurred major life problems. The literature has documented negative consequences of interacting with social partners suffering life problems (Fingerman et al., 2012; Fingerman, Huo, & Birditt, 2019; Kiecolt-Glaser & Wilson, 2017). Study 3 confirmed this link, but also revealed a significant moderating effect of empathy. That is, the link between encounters with social partners suffering problems and mood was weaker in more empathic older adults than less empathic older adults. It is possible that during the encounters with social partners who have problems, more empathic older adults are more likely to offer help to these social partners, which brings rewards to more empathic older adults. In a prior study, I found that older parents' helping midlife children who had problems on a daily basis alleviated those older parents' negative mood (Huo et al., 2018). In addition, studies have shown that more empathic individuals tend to engage in constructive coping strategies (e.g., problem solving) in the face of stress (Carlo et al., 2012; Rizkalla et al., 2008). Nevertheless, this finding needs to be interpreted with caution because older adults did not indicate their specific behaviors during encounters with social partners who had problems throughout the day.

PRACTICAL IMPLICATIONS

The current studies also carry practical implications for interventions targeting older adults. Scholars have implemented trainings to improve empathy to reduce young children's aggressive behaviors (Eisenberg et al., 2010; Fonagy et al., 2009) or to enhance services health professionals provide (van Berkhout & Malouff, 2016). Yet, such empathy trainings have not been utilized in older populations.

Findings from the current dissertation suggest that improving older adults' empathy may strengthen their social connections and also promote successful aging. For example, intervention practitioners may train older adults to put themselves in their social partners' shoes, which may improve the quality of their helping behaviors (Gould & Gautreau, 2014; Verhofstadt et al., 2008, 2016). Also, many care recipients are older adults; training their empathy may presumably facilitate their communication with caregivers and protect both parties' well-being.

LIMITATIONS AND FUTURE DIRECTIONS

I raise several limitations of this dissertation that warrant consideration. The current studies relied on older adults' self-reports of their empathy and social experiences, which may be subject to social desirability. Some recent research has tested older adults' empathy by testing their ability to recognize facial expressions (Grainger et al., 2015) or their muscle responses in response to emotional videos (Hühnel, Fölster, Werheid, & Hess, 2014). Future research may also obtain reports from a close other like a spouse, parent, child or friend. In addition, as explained above, it is necessary to assess social partners' empathy and their reports' social experiences. Moreover, future research

may capture what happens in a social encounter more objectively, such as with audio recordings of conversations. For example, during the contact with social partners who have problems, are more empathic older adults more likely to help address these partners' troubles whereas less empathic older adults more likely to blame them? Researchers may also ask the social partners suffering problems to indicate how they perceive they were being treated in social encounters. The current studies were not able to answer these questions. Further, Studies 2 and 3 focused on emotional mood but future research may consider other health outcomes, such as physical or cognitive well-being on a daily basis. It is possible that the cost of empathy that I failed to capture in my dissertation gets under the skin while older adults share others' distress. More empathic older adults may be more skilled at regulating their emotional distress or they may appraise their experiences more positively (Grühn et al., 2008). Study 3 found that having negative encounters with social partners who had problems did not reduce more empathic older adults' positive mood throughout the day. Yet, perhaps such negative encounters still induce stresses on these older adults, which could be indicated by their cortisol levels.

Lastly, this dissertation did not measure the self-centered distress that older adults may experience when sharing others' negative emotions (i.e., personal distress; Eisenberg & Eggum, 2009). Personal distress can be measure in surveys too (Davis, 1983) and it often co-occurs with individuals' concern for others' misfortunes (Decety & Lamm, 2009; Eisenberg & Eggum, 2009). Personal distress may be especially common in close ties (McGrath & Oakley, 2012). The literature links self-centered distress to fewer helping behaviors and reduced well-being (Decety & Lamm, 2009; Hoffman, 2008) but

little research examined these links in real-life settings.

Despite these limitations, this dissertation still identifies the key role that empathy plays in late life and refines our understanding of individual differences in socioemotional aging. More empathic older adults do not necessarily have more contact with their social partners, but when contact does occur, these older adults tend to exchange support. Moreover, being empathic potentially improves older adults' relationship qualities and builds their resilience in the face of stress. Findings also offer new insights into family therapies or health-promotion interventions targeting older adults who incur loneliness or social isolation and who have health concerns.

Appendix

1. Please take this diagram. *(Hand participant a social convoy).* I want to ask you some questions about people who are important in your life right now.

2. To get it straight, I'm going to ask you to use that diagram to help draw a picture of your personal network. This is a picture with you in the middle and three circles around you---kind of like a bull's-eye.

3. Think of the people closest to you, the people who are most important to you. I'm going to ask you to put them into three groups, one group for each of the three circles in order of how much they mean to you. There is no need to put down everyone you know. Circles can be empty, full, or anywhere in between.

(Interviewer is recording first names and last initial in the survey instrument at the same time).

I1. Beginning with the people you feel closest to, is there any one person or persons that you feel so close to that it's hard to imagine life without them?

0. NO → GO TO I2
1. YES → GO TO I1a

I1a. Those people will go in the first circle. Using the diagram, jot down the first name and last initial of those people you cannot live without, in order of how much they mean to you.

Please tell me the first name and last initial of the people in the first circle.

I2. Are there people to whom you may not feel quite that close, but who are still very important to you? Those people go in the second circle.

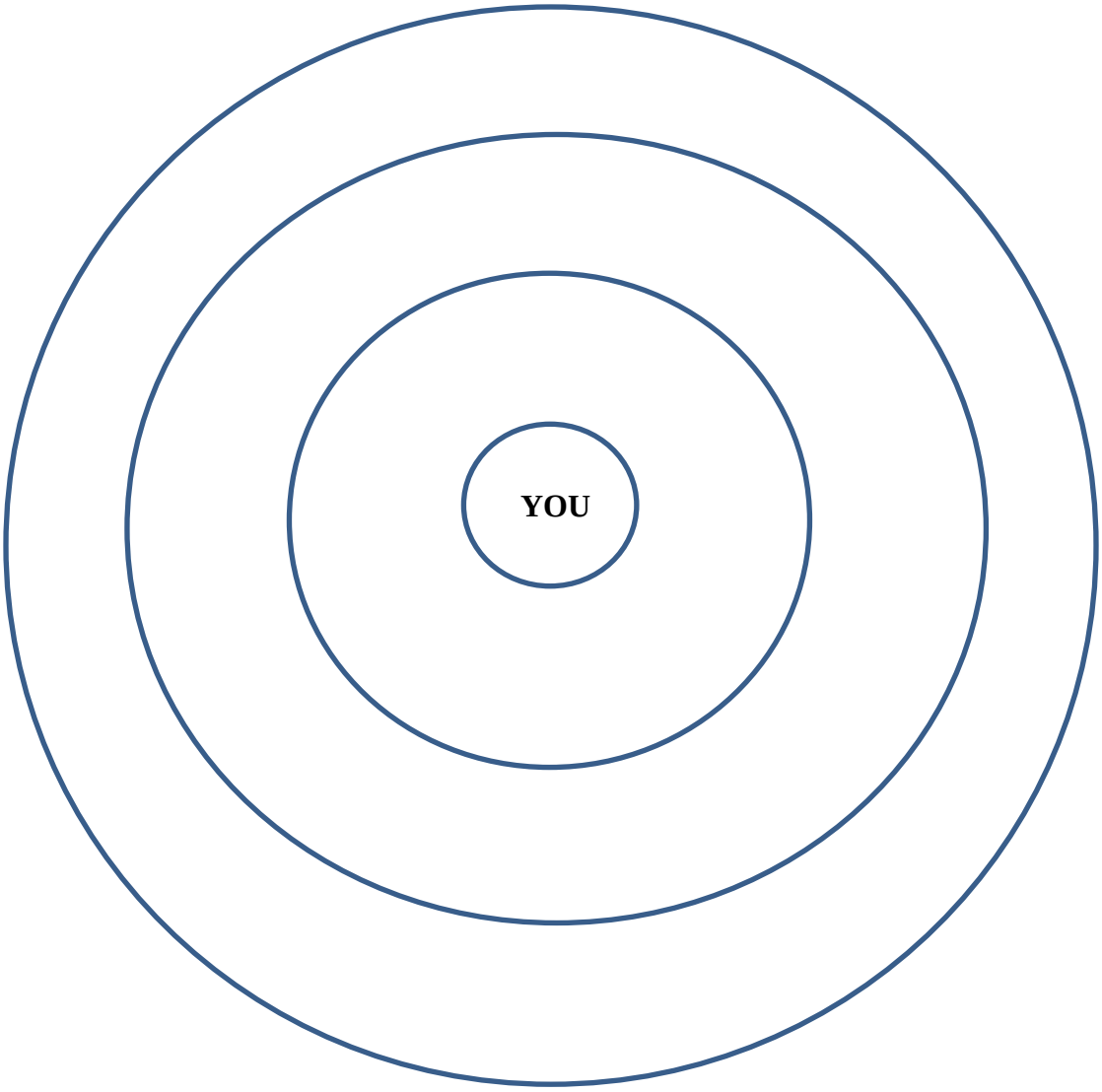
0. NO → GO TO I3
1. YES → GO TO I2a

I2a. Using the diagram, jot down the first name and last initial of those people. Please tell me the first name and last initial of the people you have listed in the second circle

I3. Are there people whom you haven't already mentioned who are close enough and important enough in your life that they should also be placed in your diagram? Those people go in the third circle.

0. NO → GO TO SECTION J
1. YES → GO TO I3a

I3a. Using the diagram, jot down the first name and last initial of those people. Please tell me the first name and last initial of the people you have listed in the third circle.


YOU

References

Ajrouch, K. J., Antonucci, T. C., & Janevic, M. R. (2001). Social networks among Blacks and Whites: The interaction between race and age. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, *56*, S112–S118. https://doi.org/10.1093/geronb/56.2.S112

Ajrouch, K. J., Fuller, H. R., Akiyama, H., & Antonucci, T. C. (2018). Convoys of social relations in cross-national context. *The Gerontologist*, *58*, 488–499. doi:10.1093/geront/gnw204

Algoe, S. B., Haidt, J., & Gable, S. L. (2008). Beyond reciprocity: Gratitude and relationships in everyday life. *Emotion*, *8*, 425–429. http://dx.doi.org/10.1037/1528-3542.8.3.425.

Allemand, M., Steiger, A. E., & Fend, H. A. (2015). Empathy development in adolescence predicts social competencies in adulthood. *Journal of Personality*, *83*, 229–241. https://doi.org/10.1111/jopy.12098

Antonucci, T. C. (1986). Hierarchical mapping technique. *Generations*, *10*, 10–12.

Antonucci, T. C. (2001). Social relations: An examination of social networks, social support, and sense of control. In J. E. Birren & K. W. Schaie (Eds.), *Handbook of the psychology of aging* (pp. 427-453). San Diego, CA: Academic Press.

Antonucci, T. C., Ajrouch, K. J., & Birditt, K. S. (2013). The convoy model: Explaining social relations from a multidisciplinary perspective. *The Gerontologist*, *54*, 82–92. doi:10.1093/geront/gnt118

Bailey, P. E., Henry, J. D., & Von Hippel, W. (2008). Empathy and social functioning in

late adulthood. *Aging and Mental Health, 12*, 499–503. doi:10.1080/13607860802224243

Bangerter, L. R., Kim, K., Zarit, S. H., Birditt, K. S., & Fingerman, K. L. (2015). Perceptions of giving support and depressive symptoms in late life. *The Gerontologist, 55*, 770–779. doi:10.1093/geront/gnt210

Barker, E. T., Greenberg, J. S., Seltzer, M. M., & Almeida, D. M. (2012). Daily stress and cortisol patterns in parents of adult children with a serious mental illness. *Health Psychology, 31*, 130–134. http://dx.doi.org/10.1037/a0025325

Baron-Cohen, S., & Wheelwright, S. (2004). The empathy quotient: An investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. *Journal of Autism and Developmental Disorders, 34*, 163–175. https://doi.org/10.1023/B:JADD.0000022607.19833.00

Batson, C. D. (2011). *Altruism in humans*. Oxford, UK: Oxford University Press.

Batson, C. D., Duncan, B. D., Ackerman, P., Buckley, T., & Birch, K. (1981). Is empathic emotion a source of altruistic motivation? *Journal of Personality and Social Psychology, 40*, 290–302. http://dx.doi.org/10.1037/0022-3514.40.2.290

Beadle, J. N., Sheehan, A. H., Dahlben, B., & Gutchess, A. H. (2015). Aging, empathy, and prosociality. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 70*, 213–222. doi:10.1093/geronb/gbt091

Birditt, K. S., Kim, K., Zarit, S. H., Fingerman, K. L., & Loving, T. J. (2016). Daily interactions in the parent-adult child tie: Links between children's problems and parents' diurnal cortisol rhythms. *Psychoneuroendocrinology, 63*, 208–216.

doi:10.1016/j.psyneuen.2015.09.027

Birditt, K. S., Manalel, J. A., Sommers, H., Luong, G., & Fingerman, K. L. (2018). Better off alone: Daily solitude is associated with lower negative affect in more conflictual social networks. *The Gerontologist*. Advanced online publication. https://doi.org/10.1093/geront/gny060

Birditt, K. S., Nevitt, M. R., & Almeida, D. M. (2015). Daily interpersonal coping strategies: Implications for self-reported well-being and cortisol. *Journal of Social and Personal Relationships, 32*, 687–706. https://doi.org/10.1177/0265407514542726

Blair, R. J. R. (2005). Responding to the emotions of others: Dissociating forms of empathy through the study of typical and psychiatric populations. *Consciousness and Cognition, 14*, 698–718. https://doi.org/10.1016/j.concog.2005.06.004

Bloise, S. M., & Johnson, M. K. (2007). Memory for emotional and neutral information: Gender and individual differences in emotional sensitivity. *Memory*, *15*, 192–204. doi:10.1080/09658210701204456

Boerner, K., & Reinhardt, J. P. (2003). Giving while in need: Support provided by disabled older adults. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 58*, S297–S304. doi:10.1093/geronb/58.5.S297

Booker, J. A., & Dunsmore, J. C. (2016). Profiles of wisdom among emerging adults: Associations with empathy, gratitude, and forgiveness. *The Journal of Positive Psychology, 11*, 315–325. https://doi.org/10.1080/17439760.2015.1081970

Bourassa, K. J., Memel, M., Woolverton, C., & Sbarra, D. A. (2015). A dyadic approach

to health, cognition, and quality of life in aging adults. *Psychology and Aging, 30,* 449–461. doi:10.1037/pag0000025

Breen, W. E., Kashdan, T. B., Lenser, M. L., & Fincham, F. D. (2010). Gratitude and forgiveness: Convergence and divergence on self-report and informant ratings. *Personality and Individual Differences, 49,* 932-937.

Burleson, B. R. (2003). The experience and effects of emotional support: What the study of cultural and gender differences can tell us about close relationships, emotion, and interpersonal communication. *Personal Relationships, 10,* 1–23. https://doi.org/10.1111/1475-6811.00033

Caprara, G. V., Alessandri, G., Eisenberg, N., Kupfer, A., Steca, P., Caprara, M. G., ... & Abela, J. (2012). The positivity scale. *Psychological Assessment, 24,* 701–712. http://dx.doi.org/10.1037/a0026681

Carlo, G., Mestre, M. V., McGinley, M. M., Samper, P., Tur, A., & Sandman, D. (2012). The interplay of emotional instability, empathy, and coping on prosocial and aggressive behaviors. *Personality and Individual Differences, 53,* 675–680. https://doi.org/10.1016/j.paid.2012.05.022

Carstensen, L. L. (2006). The influence of a sense of time on human development. *Science, 312,* 1913–1915. doi:10.1126/science.1127488

Charles, S. T. (2010). Strength and vulnerability integration: a model of emotional well-being across adulthood. *Psychological Bulletin, 136,* 1068–1091. doi:10.1037/a0021232

Charles, S. T., & Carstensen, L. L. (2010). Social and emotional aging. *Annual Review of*

Psychology, 61, 383–409. doi:10.1146/annurev.psych.093008.100448

Charles, S. T., Piazza, J. R., Mogle, J. A., Urban, E. J., Sliwinski, M. J., & Almeida, D. M. (2016). Age differences in emotional well-being vary by temporal recall. *The Journals of Gerontology, Series B*: *Psychological Sciences and Social Sciences, 71*, 798–807. doi:10.1093/geronb/gbv011

Chatterji, S., Byles, J., Cutler, D., Seeman, T., & Verdes, E. (2015). Health, functioning, and disability in older adults: Present status and future implications. *The Lancet, 385*, 563–575. doi:10.1016/S0140-6736(14)61462-8

Cichy, K. E., Stawski, R. S., & Almeida, D. M. (2012). Racial differences in exposure and reactivity to daily family stressors. *Journal of Marriage and Family*, *74*, 572–586. doi:10.1111/j.1741-3737.2012.00971.x

Cikara, M., Bruneau, E. G., & Saxe, R. R. (2011). Us and them: Intergroup failures of empathy. *Current Directions in Psychological Science*, *20*, 149–153. https://doi.org/10.1177%2F0963721411408713

Cohen, S., Frank, E., Doyle, W. J., Skoner, D. P., Rabin, B. S., & Gwaltney Jr, J. M. (1998). Types of stressors that increase susceptibility to the common cold in healthy adults. *Health Psychology*, *17*, 214–223.

Cohen, S., Schulz, M. S., Weiss, E., & Waldinger, R. J. (2012). Eye of the beholder: The individual and dyadic contributions of empathic accuracy and perceived empathic effort to relationship satisfaction. *Journal of Family Psychology*, *26*, 236–245. http://dx.doi.org/10.1037/a0027488

Conger, R. D., Conger, K. J., & Martin, M. J. (2010). Socioeconomic status, family

processes, and individual development. *Journal of Marriage and Family, 72*, 685–704. doi:10.1111/j.1741-3737.2010.00725.x

Cornwell, B., & Laumann, E. O. (2015). The health benefits of network growth: New evidence from a national survey of older adults. *Social Science and Medicine, 125*, 94–106. https://doi.org/10.1016/j.socscimed.2013.09.011

Cox, C. L., Uddin, L. Q., Di Martino, A., Castellanos, F. X., Milham, M. P., & Kelly, C. (2012). The balance between feeling and knowing: Affective and cognitive empathy are reflected in the brain's intrinsic functional dynamics. *Social Cognitive and Affective Neuroscience, 7*, 727–737. doi:10.1093/scan/nsr051

Cramer, D., & Jowett, S. (2010). Perceived empathy, accurate empathy and relationship satisfaction in heterosexual couples. *Journal of Social and Personal Relationships, 27*, 327–349. https://doi.org/10.1177/0265407509348384

Cuff, B. M., Brown, S. J., Taylor, L., & Howat, D. J. (2016). Empathy: A review of the concept. *Emotion Review, 8,* 144–153. https://doi.org/10.1177%2F1754073914558466

Davis, J. R., & Gold, G. J. (2011). An examination of emotional empathy, attributions of stability, and the link between perceived remorse and forgiveness. *Personality and Individual Differences, 50*, 392–397. https://doi.org/10.1016/j.paid.2010.10.031

Davey, A., Janke, M., & Savla, J. (2005). Antecedants of intergenerational support: Families in contact and families as context. In M. Silverstein, R. Giarrusso, & V. L. Bengtson (Eds.), *Annual review of gerontology and geriatrics, volume 2:*

Intergenerational relations across time and place (pp. 29–54). New York, NY: Springer.

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology, 44,* 113–126. doi:10.1037/0022-3514.44.1.113

Decety, J., & Jackson, P. L. (2004). The functional architecture of human empathy. *Behavioral and Cognitive Neuroscience Reviews, 3,* 71–100. doi:10.1177/1534582304267187

Decety, J., & Lamm, C. (2009). Empathy versus personal distress: Recent evidence from social neuroscience. In J. Decety & W. Ickes (Eds.), *The social neuroscience of empathy* (pp. 199–213). Cambridge, MA: MIT press.

Decety, J., & Svetlova, M. (2012). Putting together phylogenetic and ontogenetic perspectives on empathy. *Developmental Cognitive Neuroscience, 2,* 1–24. doi:10.1016/j.dcn.2011.05.003

Denckla, C. A., Fiori, K. L., & Vingerhoets, A. J. (2014). Development of the crying proneness scale: Associations among crying proneness, empathy, attachment, and age. *Journal of Personality Assessment, 96,* 619–631. https://doi.org/10.1080/00223891.2014.899498

De Waal, F. B. (2008). Putting the altruism back into altruism: The evolution of empathy. *Annual Review of Psychology, 59,* 279–300. doi:10.1146/annurev.psych.59.103006.093625

De Wied, M., Branje, S. J., & Meeus, W. H. (2007). Empathy and conflict resolution in

friendship relations among adolescents. *Aggressive Behavior, 33,* 48–55. https://doi.org/10.1002/ab.20166

Diener, E., Lucas, R. E., & Scollon, C. N. (2006). Beyond the hedonic treadmill: Revising the adaptation theory of well-being. *American Psychologist, 61,* 305–314. doi:10.1037/0003-066X.61.4.305

Dimberg, U., Thunberg, M., & Elmehed, K. (2000). Unconscious facial reactions to emotional facial expressions. *Psychological Science, 11,* 86–89. https://doi.org/10.1111%2F1467-9280.00221

Djundeva, M., Mills, M., Wittek, R., & Steverink, N. (2015). Receiving instrumental support in late parent-child relationships and parental depression. *The Journals of Gerontology, Series B*: *Psychological Sciences and Social Sciences, 70,* 981–994. doi:10.1093/geronb/gbu136

Eagly, A. H. (2009). The his and hers of prosocial behavior: An examination of the social psychology of gender. *American Psychologist, 64,* 644–658. https://doi.org/10.1037/0003-066X.64.8.644

Einolf, C. J. (2008). Empathic concern and prosocial behaviors: A test of experimental results using survey data. *Social Science Research*, *37*, 1267–1279. https://doi.org/10.1016/j.ssresearch.2007.06.003Get rights and content

Eisenberg, N. (2000). Emotion, regulation, and moral development. *Annual Review of Psychology, 51,* 665-697. https://doi.org/10.1146/annurev.psych.51.1.665

Eisenberg, N., & Eggum, N. D. (2009). Empathic responding: Sympathy and personal distress. In J. Decety & W. Ickes (Eds.), *The social neuroscience of empathy* (pp.

71–83). Boston, MA: The MIT Press.

Eisenberg, N., Eggum, N. D., & Di Giunta, L. (2010). Empathy-related responding: Associations with prosocial behavior, aggression, and intergroup relations. *Social Issues and Policy Review, 4*, 143–180. https://doi.org/10.1111/j.1751-2409.2010.01020.x

Eisinga, R., Grotenhuis, M. T., & Pelzer, B. (2013). The reliability of a two-item scale: Pearson, Cronbach, or Spearman-Brown? *International Journal of Public Health, 58,* 637–642. doi:10.1007/s00038-012-0416-3

English, T., & Carstensen, L. L. (2014). Selective narrowing of social networks across adulthood is associated with improved emotional experience in daily life. *International Journal of Behavioral Development, 38*, 195–202. https://doi.org/10.1177%2F0165025413515404

Feng, B., & Feng, H. (2018). Advice across cultures. In E. L. MacGeorge & L, M. Van Swol (Eds.), *The Oxford handbook of advice* (pp. 381–400). Oxford, UK: Oxford University Press.

Feng, B., & Magen, E. (2016). Relationship closeness predicts unsolicited advice giving in supportive interactions. *Journal of Social and Personal Relationships, 33,* 751–767. doi:10.1177/0265407515592262

Fingerman, K. L., & Birditt, K. S. (2010). Relationships between adults and their aging parents. In K. W. Schaie & S. L. Willis (Eds.), *Handbook of the psychology of aging* (pp. 219–232). Cambridge, MA: Academic Press.

Fingerman, K. L., Huo, M., Charles, S. T., & Umberson, D. J. (2019). Variety is the spice

of late life: Social integration and daily activity. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*. Advance online publication. https://doi.org/10.1093/geronb/gbz007

Fingerman, K. L., Huo, M., Graham, J. L., Kim, K., & Birditt, K. S. (2017). A family affair: Family typologies of problems and midlife well-being. *The Gerontologist*. Advance online publication. https://doi.org/10.1093/geront/gnx131

Fingerman, K. L., Kim, K., Davis, E. M., Furstenberg, F. F., Jr., Birditt, K. S., & Zarit, S. H. (2015). "I'll give you the world": Parental socioeconomic background and assistance to young adult children. *Journal of Marriage and Family, 77,* 844–865. doi:10.1111/jomf.12204

Fingerman, K. L., Kim, K., Tennant, P. S., Birditt, K. S., & Zarit, S. H. (2016). Intergenerational support in a daily context. *The Gerontologist, 56,* 896–908. doi:10.1093/geront/gnv035

Fingerman, K. L., Miller, L., Birditt, K. S., & Zarit, S. H. (2009). Giving to the good and the needy: Parental support of grown children. *Journal of Marriage and Family, 71,* 1220–1233. doi:10.1111/j.1741-3737.2009.00665.x

Fingerman, K. L., Pitzer, L. M., Chan, W., Birditt, K., Franks, M. M., & Zarit, S. (2011). Who gets what and why? Help middle-aged adults provide to parents and grown children. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 66,* 87–98. doi:10.1093/geronb/gbq009

Fiori, K. L., Rauer, A. J., Birditt, K. S., Brown, E., Jager, J., & Orbuch, T. L. (2017). Social network typologies of Black and White married couples in midlife. *Journal*

of Marriage and Family, 79, 571–589. doi:10.1111/jomf.12330

Fiori, K. L., Smith, J., & Antonucci, T. C. (2007). Social network types among older adults: A multidimensional approach. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 62*, P322–P330. https://doi.org/10.1093/geronb/62.6.P322

Fonagy, P., Twemlow, S. W., Vernberg, E. M., Nelson, J. M., Dill, E. J., Little, T. D., & Sargent, J. A. (2009). A cluster randomized controlled trial of child-focused psychiatric consultation and a school systems-focused intervention to reduce aggression. *Journal of Child Psychology and Psychiatry, 50*, 607–616. https://doi.org/10.1111/j.1469-7610.2008.02025.x

Fung, H. H., Carstensen, L. L., & Lang, F. R. (2001). Age-related patterns in social networks among European Americans and African Americans: Implications for socioemotional selectivity across the life span. *The International Journal of Aging & Human Development, 52*, 185–206. https://doi.org/10.2190%2F1ABL-9BE5-M0X2-LR9V

German, T. P., & Hehman, J. A. (2006). Representational and executive selection resources in 'theory of mind': Evidence from compromised belief-desire reasoning in old age. *Cognition, 101*, 129–152. https://doi.org/10.1016/j.cognition.2005.05.007

Giammarco, E. A., & Vernon, P. A. (2014). Vengeance and the Dark Triad: The role of empathy and perspective taking in trait forgivingness. *Personality and Individual Differences, 67*, 23–29. doi:10.1016/j.paid.2014.02.010

Gilligan, M., Suitor, J. J., Rurka, M., Con, G., & Pillemer, K. (2017). Adult children's serious health conditions and the flow of support between the generations. *The Gerontologist*, *57*, 179–190. https://doi.org/10.1093/geront/gnv075

Gleason, M. E. J., & Iida, M. (2015). Social support. In M. Mikulincer, P. R. Shaver, J. A. Simpson, & J. F. Dovidio (Eds.), *APA handbook of personality and social psychology* (pp. 351–370). Washington, DC: American Psychological Association. doi:10.1037/14344-013

Gleason, M. E., Iida, M., Bolger, N., & Shrout, P. E. (2003). Daily supportive equity in close relationships. *Personality and Social Psychology Bulletin*, *29,* 1036–1045. https://doi.org/10.1177/0146167203253473

Gleason, M. E., Iida, M., Shrout, P. E., & Bolger, N. (2008). Receiving support as a mixed blessing: Evidence for dual effects of support on psychological outcomes. *Journal of Personality and Social Psychology*, *94,* 824–838. http://dx.doi.org/10.1037/0022-3514.94.5.824

Grainger, S. A., Henry, J. D., Phillips, L. H., Vanman, E. J., & Allen, R. (2015). Age deficits in facial affect recognition: The influence of dynamic cues. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, *72*, 622–632. https://doi.org/10.1093/geronb/gbv100

Graziano, W. G., Habashi, M. M., Sheese, B. E., & Tobin, R. M. (2007). Agreeableness, empathy, and helping: A person× situation perspective. *Journal of Personality and Social Psychology*, *93*, 583–599. https://psycnet.apa.org/doi/10.1037/0022-3514.93.4.583

Graziano, W. G., & Tobin, R. M. (2002). Agreeableness: Dimension of personality or social desirability artifact?. *Journal of Personality*, *70*, 695–728. https://doi.org/10.1111/1467-6494.05021

Grissom, N., & Bhatnagar, S. (2009). Habituation to repeated stress: Get used to it. *Neurobiology of Learning and Memory*, *92*, 215–224. https://doi.org/10.1016/j.nlm.2008.07.001

Gruenewald, T. L., Karlamangla, A. S., Greendale, G. A., Singer, B. H., & Seeman, T. E. (2007). Feelings of usefulness to others, disability, and mortality in older adults: The MacArthur study of successful aging. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, *62*, P28–P37. doi:10.1093/geronb/62.1.P28

Grühn, D., Rebucal, K., Diehl, M., Lumley, M., & Labouvie-Vief, G. (2008). Empathy across the adult lifespan: Longitudinal and experience-sampling findings. *Emotion*, *8*, 753–765. doi:10.1037/a0014123

Guo, G., & Zhao, H. (2000). Multilevel modeling for binary data. *Annual Review of Sociology*, *26*, 441–462. doi:10.1146/annurev.soc.26.1.441

Haas, B. W., Ishak, A., Denison, L., Anderson, I., & Filkowski, M. M. (2015). Agreeableness and brain activity during emotion attribution decisions. *Journal of Research in Personality*, *57*, 26–31. https://doi.org/10.1016/j.jrp.2015.03.001

Helson, R., Jones, C., & Kwan, V. S. (2002). Personality change over 40 years of adulthood: hierarchical linear modeling analyses of two longitudinal samples. *Journal of Personality and Social Psychology*, *83*, 752–766.

http://dx.doi.org/10.1037/0022-3514.83.3.752

Hodges, S. D., & Biswas-Diener, R. (2007). Balancing the empathy expense account: Strategies for regulating empathic response. In T. F. D. Farrow & P. W. R. Woodruff (Eds.). *Empathy in mental illness* (pp. 389–407). Cambridge, UK: Cambridge University Press.

Hoffman, M. L. (2001). *Empathy and moral development: Implications for caring and justice*. Cambridge, UK: Cambridge University Press.

Hoffman, M. L. (2008). Empathy and prosocial behavior. In M. Lewis, M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of emotions* (pp. 440–455). NY, NY: Guilford press.

Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: A meta-analytic review. *Perspectives on Psychological Science*, *10*, 227–237. https://doi.org/10.1177%2F1745691614568352

Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: A meta-analytic review. *PLOS Medicine, 7*: e1000316. https://doi.org/10.1371/journal.pmed.1000316

Hühnel, I., Fölster, M., Werheid, K., & Hess, U. (2014). Empathic reactions of younger and older adults: No age related decline in affective responding. *Journal of Experimental Social Psychology*, 50, 136–143. https://doi.org/10.1016/j.jesp.2013.09.011

Huo, M., Fuentecilla, J. L., Birditt, K. S., & Fingerman, K. L. (2019). *Empathy and older adults' support exchanges in a daily context.* Journal of Social and Personal Relationships. Advance online publication. doi:10.1177/0265407519837372

Huo, M., Graham, J. L., Kim, K., Birditt, K. S., & Fingerman, K. L. (2019). Aging parents' daily support exchanges with adult children suffering problems. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*. Advance online publication. doi:10.1093/geronb/gbx079

Huo, M., Graham, J. L., Kim, K., Zarit, S. H., & Fingerman, K. L. (2018). Aging parents' disability and daily support exchanges with middle-aged children. *The Gerontologist, 58,* 872–882. doi:10.1093/geront/gnx144

Ickes, W., & Hodges, S. D. (2013). Empathic accuracy in close relationships. In J. A. Simpson & L. Campbell (Eds.), *The oxford handbook of close relationships,* 348–373.

Idler, E. L., & Kasl, S. V. (1995). Self-ratings of health: Do they also predict change in functional ability? *Journal of Gerontology: Social Sciences, 50,* S344–S353. doi:10.1093/geronb/50B.6.S344

Inagaki, T. K., & Orehek, E. (2017). On the benefits of giving social support: When, why, and how support providers gain by caring for others. *Current Directions in Psychological Science, 26,* 109–113.

Isherwood, L. M., Luszcz, M. A., & King, D. S. (2016). Reciprocity in material and time support within parent–child relationships during late-life widowhood. *Ageing and Society, 36,* 1668–1689. https://doi.org/10.1017/S0144686X15000537

Johnson, M. K. (2013). Parental financial assistance and young adults' relationships with parents and well-being. *Journal of Marriage and Family*, *75*, 713–733. doi:10.1111/jomf.12029

Kahana, E., Bhatta, T., Lovegreen, L. D., Kahana, B., & Midlarsky, E. (2013). Altruism, helping, and volunteering: Pathways to well-being in late life. *Journal of Aging and Health*, *25*, 159–187. https://doi.org/10.1177%2F0898264312469665

Kang, J., Ham, B. J., & Wallraven, C. (2017). Cannot avert the eyes: Reduced attentional blink toward others' emotional expressions in empathic people. *Psychonomic Bulletin and Review*, *24*, 810–820. https://doi.org/10.3758/s13423-016-1171-x

Kiecolt-Glaser, J. K., & Wilson, S. J. (2017). Lovesick: How couples' relationships influence health. *Annual Review of Clinical Psychology*, *13*, 421–443. https://doi.org/10.1146/annurev-clinpsy-032816-045111

Klimecki, O., & Singer, T. (2012). Empathic distress fatigue rather than compassion fatigue? Integrating findings from empathy research in psychology and social neuroscience. In B. Oakley, A. Knafo, G. Madhavan, & D. S. Wilson (Eds.), *Pathological altruism* (pp. 368–383). Oxford, UK: Oxford University Press.

Lachman, M. E., & Weaver, S. L. (1997). *The Midlife Development Inventory (MIDI) Personality Scales: Scale construction and scoring*. Waltham, MA: Brandeis University.

Lovett, B. J., & Sheffield, R. A. (2007). Affective empathy deficits in aggressive children and adolescents: A critical review. *Clinical Psychology Review*, *27*, 1–13. https://doi.org/10.1016/j.cpr.2006.03.003

Main, A., Walle, E. A., Kho, C., & Halpern, J. (2017). The interpersonal functions of empathy: A relational perspective. *Emotion Review*, *9*, 358–366. https://doi.org/10.1177%2F1754073916669440

Manczak, E. M., DeLongis, A., & Chen, E. (2016). Does empathy have a cost? Diverging psychological and physiological effects within families. *Health Psychology*, *35*, 211–218. doi:10.1037/hea0000281

Maner, J. K., & Gailliot, M. T. (2007). Altruism and egoism: Prosocial motivations for helping depend on relationship context. *European Journal of Social Psychology, 37*, 347–358. https://doi.org/10.1002/ejsp.364

McGrath, M., & Oakley, B. (2012). Codependency and pathological altruism. In B. Oakley, A. Knafo, G. Madhavan, & D. S. Wilson (Eds.), *Pathological altruism* (pp. 10–30). Oxford, UK: Oxford University Press.

McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology*, *27,* 415–444. https://doi.org/10.1146/annurev.soc.27.1.415

Melchers, M. C., Li, M., Haas, B. W., Reuter, M., Bischoff, L., & Montag, C. (2016). Similar personality patterns are associated with empathy in four different countries. *Frontiers in Psychology, 7*: 290. https://doi.org/10.3389/fpsyg.2016.00290

Montez, J. K., Hummer, R. A., & Hayward, M. D. (2012). Educational attainment and adult mortality in the United States: A systematic analysis of functional form. *Demography*, *49*, 315–336. https://doi.org/10.1007/s13524-011-0082-8

Mooradian, T. A., Davis, M., & Matzler, K. (2011). Dispositional empathy and the hierarchical structure of personality. *The American Journal of Psychology, 124*, 99–109. doi:10.5406/amerjpsyc.124.1.0099

Moore, R. C., Dev, S. I., Jeste, D. V., Dziobek, I., & Eyler, L. T. (2015). Distinct neural correlates of emotional and cognitive empathy in older adults. *Psychiatry Research: Neuroimaging, 232*, 42–50. https://doi.org/10.1016/j.pscychresns.2014.10.016

Moran, J. M. (2013). Lifespan development: The effects of typical aging on theory of mind. *Behavioural Brain Research, 237*, 32–40. https://doi.org/10.1016/j.bbr.2012.09.020

Morelli, S. A., Lee, I. A., Arnn, M. E., & Zaki, J. (2015). Emotional and instrumental support provision interact to predict well-being. *Emotion, 15*, 484-493. http://dx.doi.org/10.1037/emo0000084

Morelli, S. A., Lieberman, M. D., & Zaki, J. (2015). The emerging study of positive empathy. *Social and Personality Psychology Compass, 9*, 57–68. https://doi.org/10.1111/spc3.12157

Morelli, S. A., Rameson, L. T., & Lieberman, M. D. (2012). The neural components of empathy: predicting daily prosocial behavior. *Social Cognitive and Affective Neuroscience, 9*, 39–47. doi:10.1093/scan/nss088

Mroczek, D. K., & Almeida, D. M. (2004). The effect of daily stress, personality, and age on daily negative affect. *Journal of Personality, 72*, 355–378. doi:10.1111/j.0022-3506.2004.00265.x

Oakley, B., Knafo, A., Madhavan, G., & Wilson, D. S. (Eds.). (2011). *Pathological altruism*. Oxford, UK: Oxford University Press.

O'Brien, E., Konrath, S. H., Grühn, D., & Hagen, A. L. (2013). Empathic concern and perspective taking: Linear and quadratic effects of age across the adult life span. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, *68*, 168–175. doi:10.1093/geronb/gbs055

Paciello, M., Fida, R., Cerniglia, L., Tramontano, C., & Cole, E. (2013). High cost helping scenario: The role of empathy, prosocial reasoning and moral disengagement on helping behavior. *Personality and Individual Differences, 55*, 3–7. https://doi.org/10.1016/j.paid.2012.11.004

Paleari, F. G., Regalia, C., & Fincham, F. (2005). Marital quality, forgiveness, empathy, and rumination: A longitudinal analysis. *Personality and Social Psychology Bulletin*, *31*, 368–378. https://doi.org/10.1177/0146167204271597

Phillips, L. H., MacLean, R. D., & Allen, R. (2002). Age and the understanding of emotions: Neuropsychological and sociocognitive perspectives. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 57*, P526–P530. https://doi.org/10.1093/geronb/57.6.P526

Piazza, J. R., Charles, S. T., Stawski, R. S., & Almeida, D. M. (2013). Age and the association between negative affective states and diurnal cortisol. *Psychology and Aging*, *28*, 47–56. doi:10.1037/a0029983

Pillemer, K., Suitor, J. J., Riffin, C., & Gilligan, M. (2017). Adult children's problems and mothers' well-being Does parental favoritism matter? *Research on Aging*, *39*,

375–395. doi:10.1177/0164027515611464

Pinquart, M., & Sörensen, S. (2003). Differences between caregivers and noncaregivers in psychological health and physical health: A meta-analysis. *Psychology and Aging, 18*, 250–267. doi:10.1037/0882-7974.18.2.250

Pinquart, M., & Sörensen, S. (2011). Spouses, adult children, and children-in-law as caregivers of older adults: A meta-analytic comparison. *Psychology and Aging, 26*, 1–14. http://dx.doi.org/10.1037/a0021863

Preston, S. D., & De Waal, F. B. (2002). Empathy: Its ultimate and proximate bases. *Behavioral and Brain Sciences, 25*, 1–20. doi:10.1017/S0140525X02000018

Rafaeli, E., & Gleason, M. E. (2009). Skilled support within intimate relationships. *Journal of Family Theory and Review, 1*, 20–37. https://doi.org/10.1111/j.1756-2589.2009.00003.x

Rameson, L. T., Morelli, S. A., & Lieberman, M. D. (2012). The neural correlates of empathy: Experience, automaticity, and prosocial behavior. *Journal of Cognitive Neuroscience, 24*, 235–245. doi:10.1162/jocn_a_00130

Reinhardt, J. P., Boerner, K., & Horowitz, A. (2006). Good to have but not to use: Differential impact of perceived and received support on well-being. *Journal of Social and Personal Relationships, 23*, 117–129. https://doi.org/10.1177%2F0265407506060182

Reis, H. T., Clark, M. S., & Holmes, J. G. (2004). Perceived partner responsiveness as an organizing construct in the study of intimacy and closeness. In D. J. Mashek & A. Aron (Eds.), *Handbook of closeness and intimacy* (pp. 201–225). London, UK:

Psychology Press.

Rendall, M. S., Weden, M. M., Favreault, M. M., & Waldron, H. (2011). The protective effect of marriage for survival: A review and update. *Demography*, *48*, 481–506. https://doi.org/10.1007/s13524-011-0032-5

Richter, D., & Kunzmann, U. (2011). Age differences in three facets of empathy: Performance-based evidence. *Psychology and Aging*, *26*, 60–70. http://dx.doi.org/10.1037/a0021138

Rizkalla, L., Wertheim, E. H., & Hodgson, L. K. (2008). The roles of emotion management and perspective taking in individuals' conflict management styles and disposition to forgive. *Journal of Research in Personality*, *42*, 1594–1601. https://doi.org/10.1016/j.jrp.2008.07.014

Robinson, M. D., Ode, S., Moeller, S. K., & Goetz, P. W. (2007). Neuroticism and affective priming: Evidence for a neuroticism-linked negative schema. *Personality and Individual Differences*, *42*, 1221–1231. https://doi.org/10.1016/j.paid.2006.09.027

Roelofs, J., Huibers, M., Peeters, F., Arntz, A., & van Os, J. (2008). Rumination and worrying as possible mediators in the relation between neuroticism and symptoms of depression and anxiety in clinically depressed individuals. *Behaviour Research and Therapy*, *46*, 1283–1289. https://doi.org/10.1016/j.brat.2008.10.002

Rook, K. S. (2001). Emotional health and positive versus negative social exchanges: A daily diary analysis. *Applied Developmental Science*, *5*, 86–97. http://dx.doi.org/10.1207/S1532480XADS0502_4

Rook, K. S. (2015). Social networks in later life: Weighing positive and negative effects on health and well-being. *Current Directions in Psychological Science, 24*, 45–51. https://doi.org/10.1177/0963721414551364

Rook, K. S., & Charles, S. T. (2017). Close social ties and health in later life: Strengths and vulnerabilities. *American Psychologist, 72*, 567–577. https://psycnet.apa.org/doi/10.1037/amp0000104

Roper, S. O., & Yorgason, J. B. (2009). Older adults with diabetes and osteoarthritis and their spouses: Effects of activity limitations, marital happiness, and social contacts on partners' daily mood. *Family Relations, 58*, 460–474. https://doi.org/10.1111/j.1741-3729.2009.00566.x

Rosenfield, S. (2012). Triple jeopardy? Mental health at the intersection of gender, race, and class. *Social Science and Medicine, 74*, 1791–1801. https://doi.org/10.1016/j.socscimed.2011.11.010

Rusbult, C. E., Finkel, E. J., & Kumashiro, M. (2009). The Michelangelo phenomenon. *Current Directions in Psychological Science, 18*, 305–309. https://doi.org/10.1111/j.1467-8721.2009.01657.x

Sagi, A., & Hoffman, M. L. (1976). Empathic distress in the newborn. *Developmental Psychology, 12*, 175–176. https://psycnet.apa.org/doi/10.1037/0012-1649.12.2.175

Seidman, G., Shrout, P. E., & Bolger, N. (2006). Why is enacted social support associated with increased distress? Using simulation to test two possible sources of spuriousness. *Personality and Social Psychology Bulletin, 32*, 52–65.

https://doi.org/10.1177%2F0146167205279582

Seltzer, M. M., Almeida, D. M., Greenberg, J. S., Savla, J., Stawski, R. S., Hong, J., & Taylor, J. L. (2009). Psychosocial and biological markers of daily lives of midlife parents of children with disabilities. *Journal of Health and Social behavior, 50,* 1–15. https://doi.org/10.1177%2F002214650905000101

Shamay-Tsoory, S. G., Aharon-Peretz, J., & Perry, D. (2009). Two systems for empathy: A double dissociation between emotional and cognitive empathy in inferior frontal gyrus versus ventromedial prefrontal lesions. *Brain, 132,* 617–627. https://doi.org/10.1093/brain/awn279

Shiffman, S., Stone, A. A., & Hufford, M. R. (2008). Ecological momentary assessment. *Annual Review of Clinical Psychology, 4,* 1–32. https://doi.org/10.1146/annurev.clinpsy.3.022806.091415

Simner, M. L. (1971). Newborn's response to the cry of another infant. *Developmental Psychology, 5,* 136–150. https://psycnet.apa.org/doi/10.1037/h0031066

Simpson, J. A., Ickes, W., & Orina, M. (2001). Empathic accuracy and preemptive relationship maintenance. In J. H. Harvey & A. Wenzel (Eds.), *Close romantic relationships: Maintenance and enhancement* (pp. 27–46). Mahwah, NJ: Lawrence Erlbaum Associates.

Singer, T. (2006). The neuronal basis and ontogeny of empathy and mind reading: Review of literature and implications for future research. *Neuroscience and Biobehavioral Reviews, 30,* 855–863. https://doi.org/10.1016/j.neubiorev.2006.06.011

Smith, R. H., Powell, C. A., Combs, D. J., & Schurtz, D. R. (2009). Exploring the when and why of schadenfreude. *Social and Personality Psychology Compass*, *3*, 530–546. https://doi.org/10.1111/j.1751-9004.2009.00181.x

Stern, J. A., & Cassidy, J. (2017). Empathy from infancy to adolescence: An attachment perspective on the development of individual differences. *Developmental Review*. Advance online publication. https://doi.org/10.1016/j.dr.2017.09.002

Stürmer, S., Snyder, M., & Omoto, A. M. (2005). Prosocial emotions and helping: The moderating role of group membership. *Journal of Personality and Social Psychology, 88*, 532–546. doi:10.1037/0022-3514.88.3.532

Suitor, J. J., Pillemer, K., & Sechrist, J. (2006). Within-family differences in mothers' support to adult children. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 61,* S10–S17. doi:10.1093/geronb/61.1.S10

Swartz, T. T. (2009). Intergenerational family relations in adulthood: Patterns, variations, and implications in the contemporary United States. *Annual Review of Sociology*, *25,* 191–212. doi:10.1146/annurev.soc.34.040507.134615

Sze, J. A., Gyurak, A., Goodkind, M. S., & Levenson, R. W. (2012). Greater emotional empathy and prosocial behavior in late life. *Emotion*, *12*, 1129–1140. doi:10.1037/a0025011

Thoits, P. A. (2011). Mechanisms linking social ties and support to physical and mental health. *Journal of Health and Social Behavior, 52*, 145–161. https://doi.org/10.1177/0022146510395592

Thomas, P. A. (2010). Is it better to give or to receive? Social support and the well-being

of older adults. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 65B*, S351–S357. doi:10.1093/geronb/gbp113

Timmons, A. C., Arbel, R., & Margolin, G. (2017). Daily patterns of stress and conflict in couples: Associations with marital aggression and family-of-origin aggression. *Journal of Family Psychology, 31*, 93–104. doi:10.1037/fam0000227

Uchino, B. N. (2009). Understanding the links between social support and physical health: A life-span perspective with emphasis on the separability of perceived and received support. *Perspectives on Psychological Science, 4*, 236–255. https://doi.org/10.1111%2Fj.1745-6924.2009.01122.x

Uehara, E. S. (1995). Reciprocity reconsidered: Gouldner's 'moral norm of reciprocity' and social support. *Journal of Social and Personal Relationships, 12*, 483–502. https://doi.org/10.1177/0265407595124001

U.S. Census Bureau. (2017). American Community Survey 1-Year Estimates. Retrieved from https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_ 17_1YR_S1501&prodType=table

Van der Graaff, J., Branje, S., De Wied, M., Hawk, S., Van Lier, P., & Meeus, W. (2014). Perspective taking and empathic concern in adolescence: Gender differences in developmental changes. *Developmental Psychology, 50*, 881–888. doi:10.1037/a0034325

Van Lissa, C. J., Hawk, S. T., Branje, S., Koot, H. M., & Meeus, W. H. (2016). Common and unique associations of adolescents' affective and cognitive empathy

development with conflict behavior towards parents. *Journal of Adolescence*, *47*, 60–70. https://doi.org/10.1016/j.adolescence.2015.12.005

Verhofstadt, L. L., Buysse, A., Ickes, W., Davis, M., & Devoldre, I. (2008). Support provision in marriage: The role of emotional similarity and empathic accuracy. *Emotion*, *8*, 792–802. https://psycnet.apa.org/doi/10.1037/a0013976

Verhofstadt, L., Devoldre, I., Buysse, A., Stevens, M., Hinnekens, C., Ickes, W., & Davis, M. (2016). The role of cognitive and affective empathy in spouses' support interactions: An observational study. *PloS One*, *11*, e0149944. https://doi.org/10.1371/journal.pone.0149944

Zahn-Waxler, C., & Van Hulle, C. (2012). Empathy, guilt, and depression: When caring for others becomes costly to children. In B. Oakley, A. Knafo, G. Madhavan, & D. S. Wilson (Eds.), *Pathological altruism* (pp. 321–344). New York, NY: Oxford University Press.

Zaki, J., Weber, J., Bolger, N., & Ochsner, K. (2009). The neural bases of empathic accuracy. *Proceedings of the National Academy of Sciences*, *106*, 11382–11387. https://doi.org/10.1073/pnas.0902666106

Ze, O., Thoma, P., & Suchan, B. (2014). Cognitive and affective empathy in younger and older individuals. *Aging and Mental Health*, *18*, 929–935. https://doi.org/10.1080/13607863.2014.899973